SUPER●

SUPER● X6DH3-G2
SUPER● X6DHi-G2

USER'S MANUAL

Revision 1.0b

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Manual Revision 1.0b

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Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the X6DH3-G2/X6DHi-G2 motherboard. The X6DH3-G2/X6DHi-G2 supports single or dual Intel® Xeon EM64T processors at a 800 MHz front side bus. The X6DH3-G2/X6DHi-G2 supports Hyper-Threading Technology and is ideal for high performance workstation and server environments with up to two processors on one system bus. The X6DH3-G2/X6DHi-G2 also supports the Enhanced Intel SpeedStep Technology (EIST). Please refer to the motherboard specifications pages on our web site (http://www.supermicro.com/Products) for updates or visit Intel's web site for processor support. This product is intended to be professionally installed.

Manual Organization

Chapter 1 describes the features, specifications and performance of the mainboard and provides detailed information about the chipset.

Chapter 2 provides hardware installation instructions. Read this chapter when installing the processor, memory modules and other hardware components into the system. If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for the video, the memory and the system setup stored in CMOS.

Chapter 4 includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A provides BIOS POST Messages.

Appendix B lists BIOS POST Codes.

Appendix C lists Software Installation Instructions.

Conventions Used in the Manual:

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury to yourself:

Danger/Caution: Instructions to be strictly followed to prevent catastrophic system failure or to avoid bodily injury.

Warning: Important information given to ensure proper system installation or to prevent damage to the components.

Note: Additional Information given to differentiate various models or to ensure cor rect system setup.

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Chapter 3: Troubleshooting

Chapter 4: BIOS

Appendices:

Chapter 1
Introduction

1-1   Overview

Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance. Check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer. <u>All are included in the Retail Box.</u>

One (1) Supermicro Mainboard

One (1) ribbon cable for IDE devices (CBL-036)

One (1) floppy ribbon cable (CBL-022)

One (1) COM port cable (CBL-010)

One (1) 2-port USB cable (CBL-083)

Two (2) SAS cables (CBL-097) (*For the X6DH3-G2 only)

One (1) I/O backpanel shield (CSE-PT7)

One (1) Supermicro CD containing drivers and utilities (CDR-X6)

One (1) User's/BIOS Manual

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Figure 1-1. SUPER●X6DH3-G2/X6DHi-G2 Image

Figure 1-2. SUPER● X6DH3-G2/X6DHi-G2 Motherboard Layout

(not drawn to scale)

Notes:

1. Jumpers not indicated are for testing only.

2. See Chapter 2 for detailed information on jumpers, I/O ports and JF1 front panel connections.

3. "▪" indicates the location of Pin 1.

4. For RAID to function properly, please install the ZCR Card in the Green PCI slot.

5. When the Onboard Standby PWR LED Indicator is on, it indicates that the Power and the system is on. Do not remove or install any components without turning off the system and disconnecting the AC power.

6. The drawings and pictures shown in this manual were based on the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in the manual.

7. All components related to SAS: SAS Controller, SAS 0-3, SAS 4-7 Connectors, SAS LEDs: DS 1-8, JS9, JS10 and JPS1 are for the X6DH3-G2 only.

Quick Reference (X6DH3-G2/X6DHi-G2)
(See Chapter 2 for more information.)

Jumper	Description	Default Setting
J3P	3rd PWR Supply Fail Detect	Off (Disabled)
JAR	Alarm Reset Enable	Off (Normal)
JBT1	CMOS Clear	See Chapter 2
JI^{2}C1/JI^{2}C2	PCI I^{2}C Data(JI^{2}C1)/I^{2}C Clock(JI^{2}C2)	Closed (Enabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JP1	Power Supply Force-On	Open (Disabled)
JPL1/JPL2	GLAN1/GLAN2 Enable	Pins 1-2 (Enabled)
JPS1	SAS Controller Enable	Pins 1-2 (Enabled)(*Note)
JWD	Watch Dog Enable	Pins 1-2 (Reset)

Connector	Description
ATX PWR (JPW1)	Primary 24-Pin ATX PWR Connector
CPU PWR (J1D1)	12V 8-Pin CPU PWR Connector
Aux. PWR (J38)	+12V 4-pin System PWR Connector
COM1/COM2 (J14/J15)	COM1/COM2 Serial Port Connector/Header
ACT LED (#0-#7)	SAS Activity LED Indicators (DS1-DS8) (*Note)
DIMM#1A-DIMM#4B	DDR DIMM Memory (RAM) Slots
Fans 1-8	System Fan Headers (Fans 7/8: CPU Fans 1/2)
Floppy (J12)	Floppy Disk Drive Connector
IDE1/IDE2 (J5/J6)	IDE#1/IDE#2 Hard Disk Drive Connectors
IPMI (JIPMI1)	IPMI 2.0 Socket
JD1	PWR LED (pins1-3)/SpeakerHeader (pins 4-7)
JF1	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH	Overheat LED
JS9	SAS (to IO Panel) Activity LED Header (*Note)
JS10	SAS SMBus (SAS (I^{2}C) (*Note)
JWOR	Wake-on-Ring Header
LAN 1/2 (JLAN1/2)	G-bit Ethernet Ports 1/2
KB/MS (J33)	PS2 Keyboard/Mouse Connector
Parallel	Parallel (Printer) Port
PSF (JP9)	Power Supply Failure LED Header
I-SATA 0/1	Intel Serial ATA 1/2 Ports
JSM1/JSM2 (*Note)	Adaptec SAS Ports 0-7(JSM1: SAS0-3/JSM2: SAS 4-7)
SMB	System Management Bus
SMB PS (I^{2}C) (J32)	Power Supply SMBus (I^{2}C)
USB 0/1 (J16)	Back Panel USB0/USB1 Headers
USB 2/3 (JUSB 2/3)	Front Panel Universal Serial Bus Ports 2/3
VGA (J7)	Video Connector
WOL	Wake-on-LAN Header

(*Note: For the X6DH3-G2 only)

Motherboard Features

CPU

- Single or dual Intel® Xeon™ EM64T processors at 800 MHz front side (system) bus speed with support of Hyper-Threading (HT), EM64T and Enhanced Intel SpeedStep (EIST)

Using the EM64T Feature

- Install a 64-bit OS (Windows XP Professional x64 Ed, Server 2003x64 Ed.)
- Install a 64-bit OS (Windows XP Professional x64 Ed, Server 2003x64 Ed.)
- Install the 64-bit drivers for all MB components, devices and add-on cards

Using the Hyper-Threading (HT) Technology

- Install an OS that supports HT, including Windows XP/2003 Server and Linux 2.4x. (Under Linux, use the HT compiler to compile the code. For other operating systems, be sure to disable the HT feature in the BIOS.)
- Enable the HT feature in the BIOS (under "Advanced" Setting) before install ing a supported OS. (*Note: visit www.Intel.com for CPU support and driver updates.)

Memory

- Eight 240-pin DIMM sockets supporting up to 16 GB Registered ECC, dual channel, DDR II 400 (PC3200) SDRAM

Chipset

- Intel E7520 chipset

Expansion Slots

- Two x8 PCI-E slots (*one with SEPC-Supermicro Enhanced Power Connector)
- Three 64-bit PCI-X (3.3V) slots (*One PCI-X-133 MHz slot, One PCI-X-100 MHz/ZCR slot-the green slot, One PCI-X-100 MHz slot)
- One 32-bit (5V) 33MHz PCI

BIOS

- 8 Mb Phoenix® Flash ROM
- APM 1.2, DMI 2.3, PCI 2.2, ACPI 1.0, Plug and Play (PnP)

PC Health Monitoring

- Onboard voltage monitors for CPU cores, chipset voltage, 3.3V, +5V, +12V, −12V and +5V standby
- Fan status monitor with firmware control
- CPU/chassis temperature monitors
- Environmental temperature monitor and control
- CPU fan auto-off in sleep mode
- CPU slow-down on temperature overheat
- CPU thermal trip support for processor protection, +5V standby alert LED
- Power-up mode control for recovery from AC power loss
- Auto-switching voltage regulator for CPU core

- System overheat/Fan Fail LED Indicator and control
- Chassis intrusion detection
- System resource alert via Supero Doctor III

ACPI Features

- ACPI/ACPM Power Management
- Wake-On Ring (WOR) Header
- Internal/External Modem Ring On
- Wake-On LAN (WOL) Header
- Slow blinking LED for suspend state indicator
- Main switch override mechanism

Onboard I/O

- One IPMI 2.0/1.5 socket
- Two Intel 82541P1 Gigabit Ethernet controllers
- 2 EIDE Ultra DMA/100 bus master interfaces
- 1 floppy port interface
- 1 EPP/ECP Parallel Port
- PS/2 mouse and PS/2 keyboard ports
- Up to 4 USB 2.0 (Universal Serial Bus) (2 ports, 2 Headers)
- Intel 6300ESB SATA Controller supports 2 drives (RAID 0, 1 and JBOD)
- Adaptec AIC 9410W Controller with 2 ports, supporting 8 SAS/SATA drives (*SAS is for the X6DH3-G2 only.)
- ATI 8 MB Rage XL Graphic Card
- 2 COM ports(1 header, 1 port)
- Super I/O: Winbond W83627HF w/Hardware Monitor support: W83792D

Other

- Internal/external modem ring-on
- Wake-on-LAN (WOL)
- Console redirection
- SMBus for SMC Power Supply
- Fan Speed Control by Thermal Management (via BIOS)

CD/Diskette Utilities

- BIOS flash upgrade utility, device drivers and software management

Dimensions

- ATX Ext. 12" x 13.05" (304.8 x 331.5 mm)
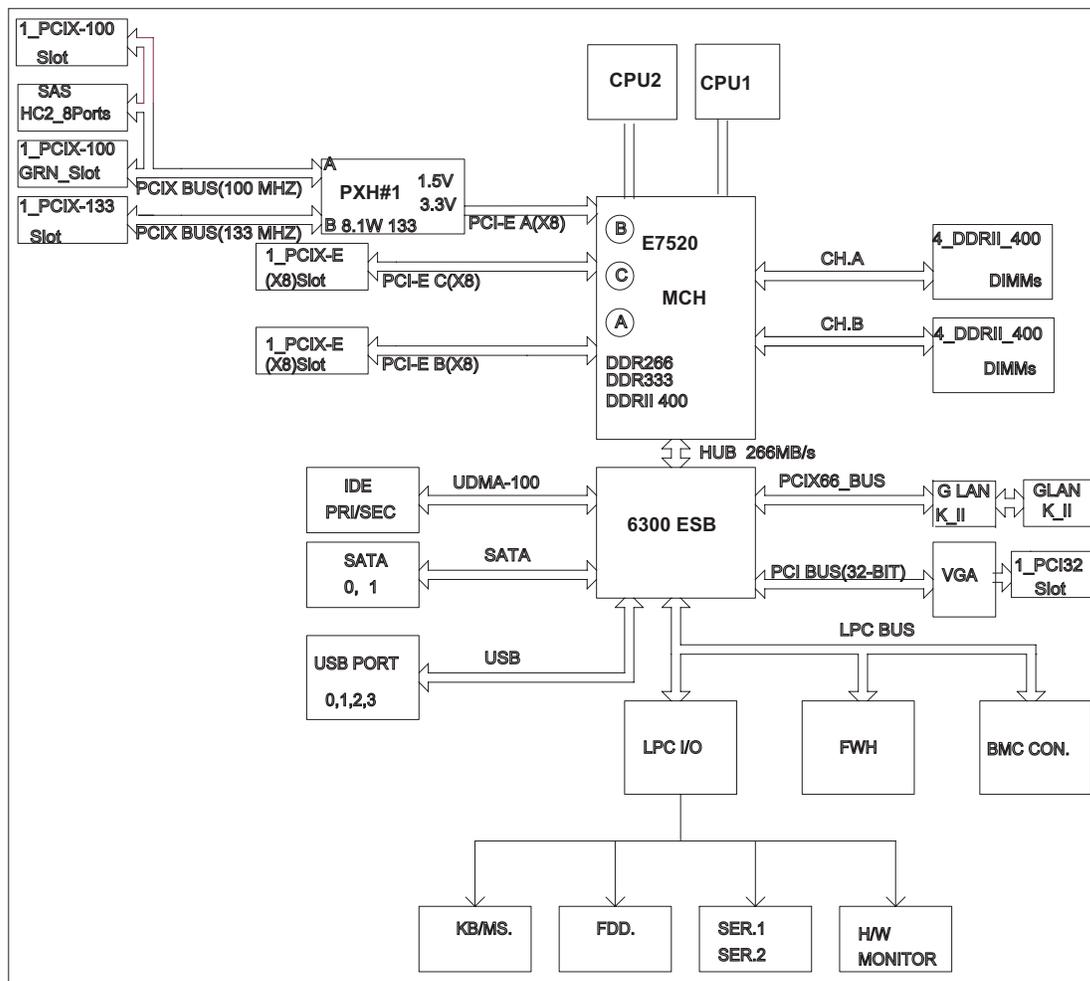
Figure 1-9.   Block Diagram of the E7520 Chipset

Note: This is a general block diagram. Please see the previous Motherboard Features pages for details on the features of the motherboard.

1-2   Chipset Overview

Built upon the functionality and the capability of the 7520 chipset, The X6DH3-G2/X6DHi-G2 motherboard provides the performance and feature set required for dual processor-based servers, with configuration options optimized for communications, presentation, storage, computation or database applications. The Intel E7520 chipset consists of the following components: the E7520 Memory Controller Hub (MCH), the 6300ESB I/O Controller Hub (6300ESB ICH), and the Intel PCI-X Hub (PXH).

The E7520 MCH supports single or dual Xeon EM64T processors with Front Side Bus speeds of 800 MHz. Its memory controller provides direct connection to two channels of registered DDR2 with a marched system bus address and data bandwidths of up to 5.4GB/s. The E7520 also supports the new PCI Express high speed serial I/O interface for superior I/O bandwidth. The MCH provides three configurable x8 PCI Express interfaces. These interfaces support connection of the MCH to a variety of other bridges that are compliant with the PCI Express Interface Specification, Rev. 1.0a.

6300ESB System Features

The I/O Controller Hub provides the I/O subsystem with access to the rest of the system. It supports 2-channel Ultra ATA/100 Bus Master IDE Controller, two Serial ATA (SATA) Host Controllers, SMBus 2.0 Controller, LPC/Flash BIOS Interface, PCI 2.3 Interface, and Integrated System Management Controller.

6300ESB ICH System Features

The 6300ESB ICH system consists of:

The I/O Controller Hub provides the I/O subsystem with access to the rest of the system. Additionally, it integrates many I/O functions.

The 6300ESB integrates: 2-channel Ultra ATA/100 Bus Master IDE Controller, two Serial ATA (SATA) Host Controllers, SMBus 2.0 Controller, LPC/Flash BIOS Interface, PCI-X (66MHz) 1.0 Interface, PCI 2.2 Interface and System Management Controller.

1-3   Special Features

Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power- on state. See the Power Lost Control setting in the Advanced BIOS Setup section (Peripheral Device Configuration) to change this setting. The default setting is Last State.

1-4   PC Health Monitoring

This section describes the PC health monitoring features of the SUPER X6DH3-G2/X6DHi-G2.All have an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for the CPU Cores, +3.3V, +5V, +12V, and -12V

An onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor via BIOS and SDIII

The PC health monitor can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management via BIOS and Supero Doctor III.

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. It can continue to monitor for overheat conditions even when the CPU is in sleep mode. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal control fan to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

CPU Fan Auto-Off in Sleep Mode

The CPU fan activates when the power is turned on. It continues to operate when the system enters Standby mode. When in sleep mode, the CPU will not run at full power, thereby generating less heat.

CPU Overheat LED and Fan Fail Control

This feature is available when the user enables the CPU overheat/Fan Fail warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature is exceeded, both the overheat fan and the warning LED are triggered.

System Resource Alert

This feature is available when used with Supero Doctor III in the Windows OS environment or used with Supero Doctor II in Linux. SDIII is used to notify the user of certain system events. For example, if the system is running low on virtual memory and there is insufficient hard drive space for saving the data, you can be alerted of the potential problem.

1-5   ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers. This also includes consumer devices connected to the PC such as VCRs, TVs, telephones and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with the Windows 2000, Windows XP and Windows Server 2003 Operating Systems.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Pressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just press and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.

External Modem Ring-On

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, up-dates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboard has a 3-pin header (WOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has WOL capability. Wake-On-LAN must be enabled in BIOS. Note that Wake-On-LAN can only be used with an ATX 2.01 (or above) compliant power supply.

1-6   Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The SUPER X6DH3-G2/X6DHi-G2 accommodates ATX 24-pin power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You should use one that will supply at least 400W of power. Your power supply must supply 1.5A for the Ethernet ports. The +12V, 4-pin power connector (J38) is required to ensure adequate power supply to the system. Additionally, you should also use the onboard 12V 8-pin power connector (J1D1) to support Intel Xeon CPUs. Failure to provide this extra power will result in instability of the CPU after only a few minutes of operation. See Section 2-5 for details on connecting the power supply.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (info at http://www.ssiforum.org/). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1-7 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720K,

1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s.It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP) , Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP).

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin.

The IRQs, DMAs and I/O space resources of the Super I/O can flexibly adjust to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

1-14

Chapter 2
Installation

2-1   Static-Sensitive Devices

Electric-Static-Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

*   Use a grounded wrist strap designed to prevent static discharge.
*   Touch a grounded metal object before removing the board from the antistatic bag.
*   Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
*   When handling chips or modules, avoid touching their pins.
*   Put the motherboard and peripherals back into their antistatic bags when not in use.
*   For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
*   Use only the correct type of onboard CMOS battery. Do not install the onboard upside down battery to avoid possible explosion.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

2-2   Xeon Processor and Heatsink Installation

> ⚠️ *When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the motherboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.*

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the CPU heatsink.

CPU Installation

1. Lift the lever on the CPU socket: lift the lever completely as shown on the picture on the right; otherwise, you will damage the CPU socket when power is applied. (Install CPU1 first.)

Socket lever

2. Insert the CPU in the socket, making sure that pin 1 of the CPU aligns with pin 1 of the socket (both corners are marked with a triangle). When using only one CPU, install it into CPU socket #1 (Socket #2 is automatically disabled if only one CPU is used).

Pin 1

3. Press the lever down until you hear the click, so you can be sure that the CPU is securely installed in the CPU socket.

Socket lever in the locking Position

<u>CEK Heatsink Installation</u>

CEK Passive Heatsink

1. Do not apply any thermal grease to the heatsink or the CPU die-the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

Screw#1   Screw#2

3. Screw in two diagonal screws (ie the #1 and the #2 screws) until just snug (-do not fully tighten the screws to avoid possible damage to the CPU.)

Screw#1

4. Finish the installation by fully tightening all four screws.

Screw#2
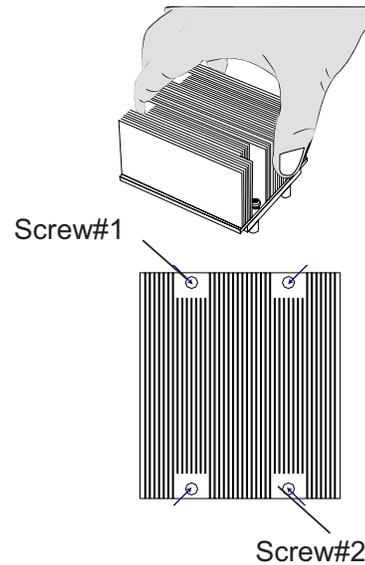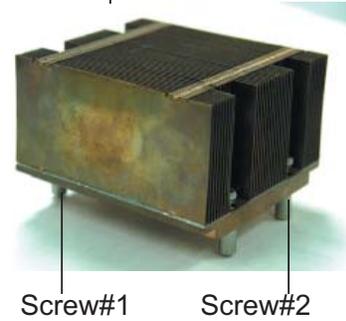
To Un-install the Heatsink

! **(Warning:** We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to uninstall the heatsink to prevent damage done to the CPU or the CPU socket.)

1. Unscrew and remove the heatsink screws from the motherboard in the sequence as show in the picture on the right.

NO.1 SCREW   NO.4 SCREW

NO.3 SCREW   NO.2 SCREW
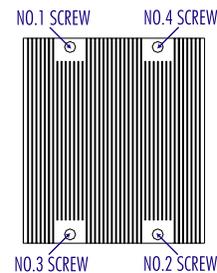
2. Hold the heatsink as show in the picture on the right and <u>gently</u> wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!!)

3. Once the CPU is loosened, remove the heatsink from the CPU socket.
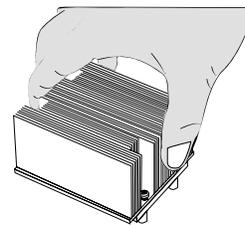
4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install the CPU and the heatsink.

Figure 2-1. PGA604 Socket: Empty and with Processor Installed

Empty socket

Lever

Warning! Make sure you lift the lever completely when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may result.

Triangle

Processor
(installed)

Triangle
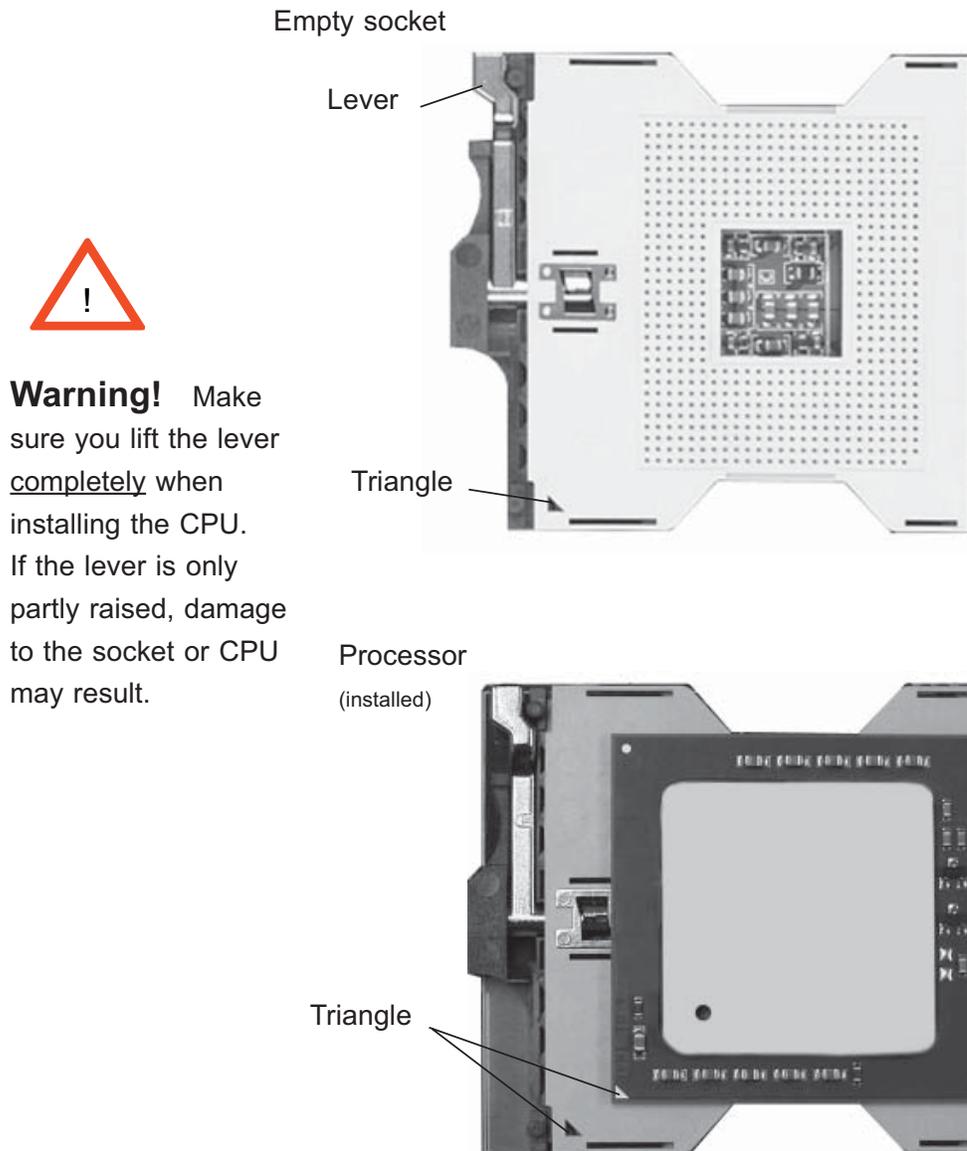
Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both the motherboard and the chassis match. Make sure that the metal standoffs click in or are screwed in tightly and then, use a screwdriver to secure the motherboard onto the motherboard tray.(Note: some components are very close to the mounting holes. Please take all necessary precautionary measures to prevent damage done to these components when installing the motherboard into the chassis.)

2-3   Installing DIMMs

(**Note:** Check the Supermicro web site for recommended memory modules: http:www. supermicro.com/)

CAUTION
Exercise extreme care when installing or removing DIMM modules
to prevent any possible damage. Also note that the memory is inter-

leaved to improve performance (see step 1).

DIMM Installation (See Figure 2-2 on Page 2-6)

1. Insert the desired number of DIMMs into the memory slots, starting with Bank 1. The memory scheme is interleaved so you must install two modules at a time, beginning with Bank 1, then Bank 2, and so on.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

Memory Support
The X6DH3-G2/X6DHi-G2 supports up to 16 GB Registered ECC DDR2 400(PC3200) memory. Please refer to Supermicro's web site at www.supermicro. com for memory updates.

Figure 2-2. Installing and Removing DDR 2

To Install:
Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

DDR 2

Notch   Notch

Release Tab   Release Tab

Note: Notch should align with the receptive point on the slot

DDR 2 Slot

Release Tab   Release Tab
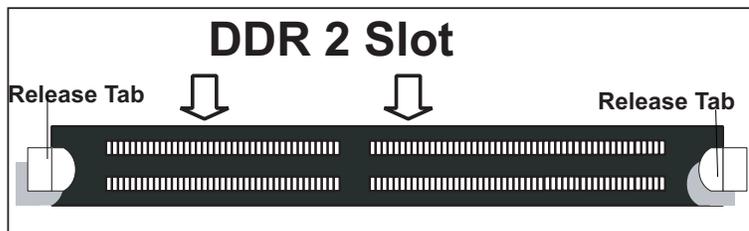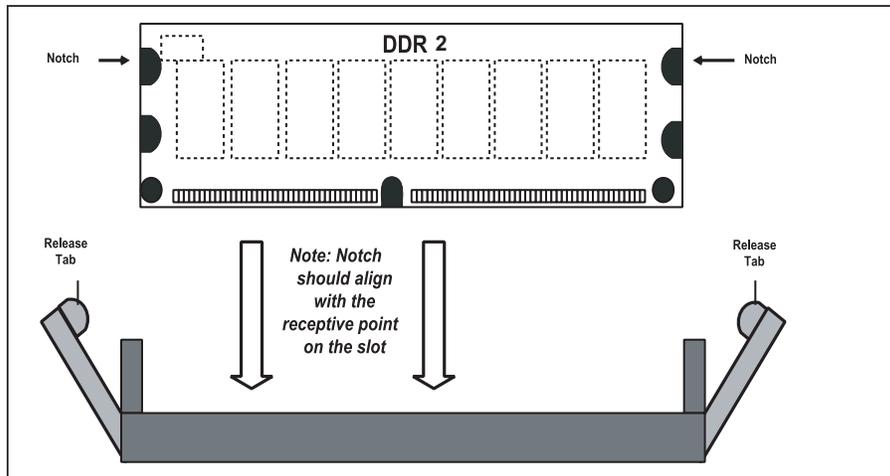
To Remove:
Use your thumbs to gently push near the edge of both ends of the module. This should release it from the slot.

2-4   I/OPorts/Control Panel Connectors

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 2-3 below for the colors and locations of the various I/O ports.

Figure 2-3. I/O Port Locations and Definitions

Mouse (Green)

Parallel Port (Burgandy)

USB0/USB1 Ports

LAN1 Port   LAN2 Port

Keyboard (Purple)

COM1 Port (Turquoise)

Video
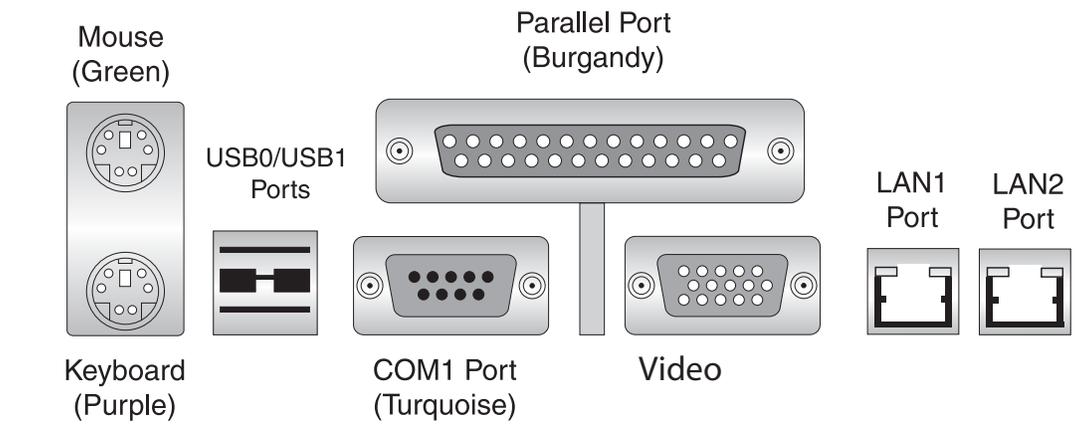
Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro server chassis. See Figure 2-4 for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

Figure 2-4. JF1 Header Pins
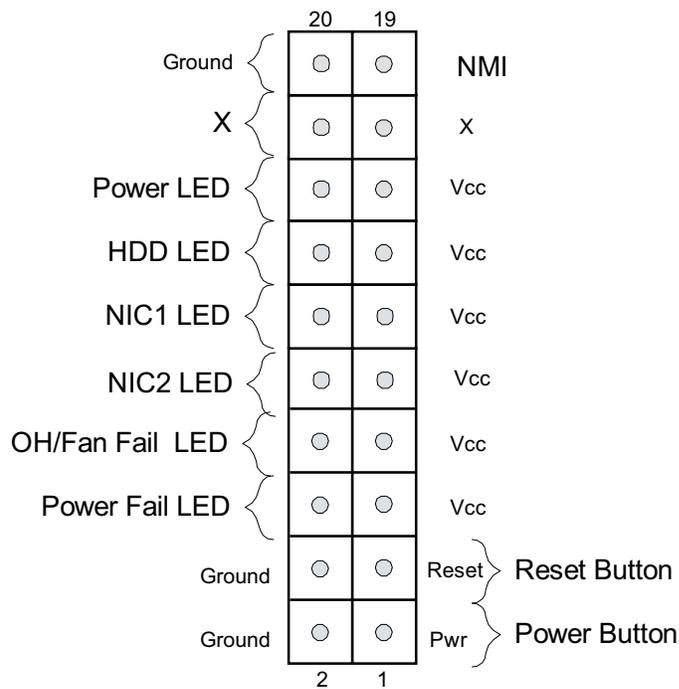
2-5   Connecting Cables

ATX Power Connector

The main power supply connector (JPW1) on the X6DH3-G2/X6DHi-G2 meets the SSI (Superset ATX) specification. You can only use a 24-pin power supply cable on the motherboard. Make sure that the orientation of the connector is correct. See the table on the right for pin definitions.

4-pin and 8-pin Power Connectors

In addition to the Primary ATX power connector (above), the 12V 8-pin connector at J1D1 and the 12V 4-pin connector at J38 must also be used to provide adequate power supply to the system. See the tables on the right for pin definitions.

ATX Power 24-pin Connector Pin Definitions			
Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

12V 4-pin Power Connector Pin Definitions	
Pins	Definition
1 and 2	Ground
3 and 3	+12V

12V 8-pin Power Connector Pin Definitions	
Pins	Definition
1 through 4	Ground
5 through 8	+12V
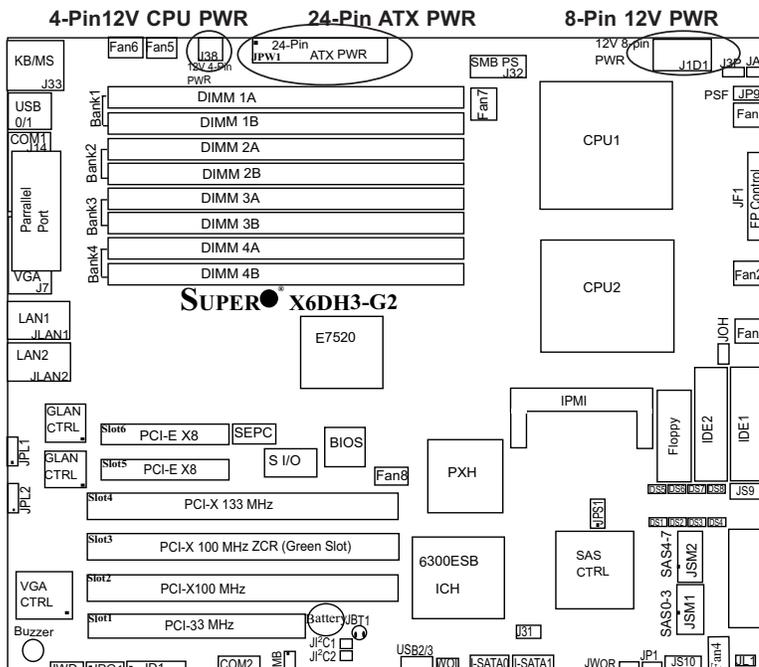
NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	+5V
16	Ground
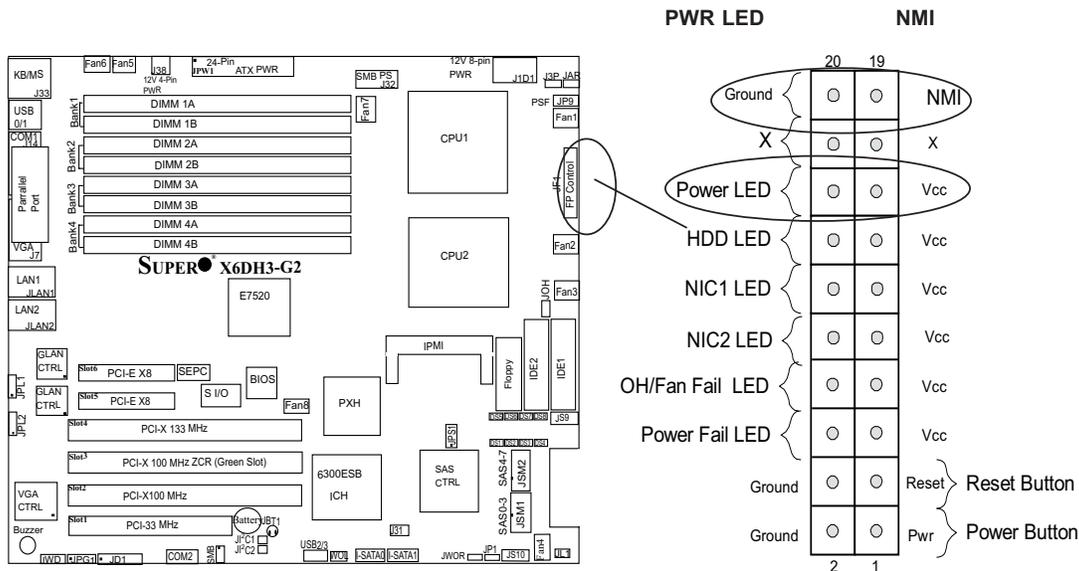
HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including SCSI, Serial ATA and IDE). See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	+5V
14	HD Active

NIC1/NIC2 LED Indicators

The NIC (Network Interface Controller) LED connections for the GLAN port1 is located on pins 11 and 12 of JF1, and for the GLAN port2 is located on pins 9 and 10 of JF1. Attach the NIC LED cables to display network activity. Refer to the tables on the right for pin definitions.

GLAN1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
11/12	Ground
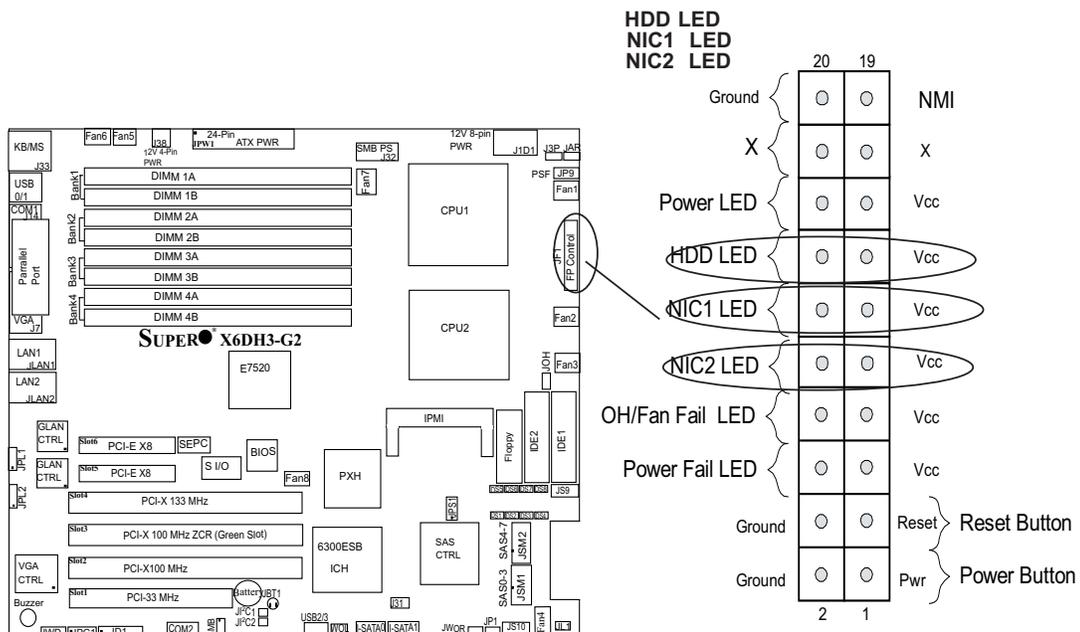
Overheat/FanFail LED

Connect an LED to the OH/Fan Fail connection on pins 7 and 8 of JF1 to provide advanced warnings of chassis overheating or system fan failure. Refer to the table on the right for pin definitions.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Ground

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

Power Fail LED

The Power Fail LED is located on Pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Ground
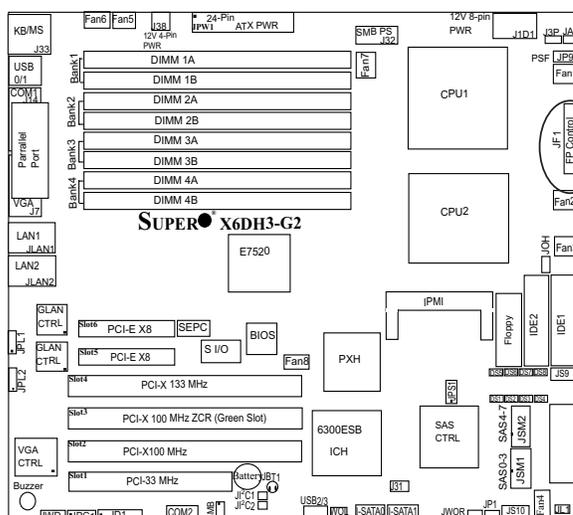
OH/Fan Fail LED
PWR Fail LED

	20	19	
Ground	○	○	NMI
X	○	○	X
Power LED	○	○	Vcc
HDD LED	○	○	Vcc
NIC1 LED	○	○	Vcc
NIC2 LED	○	○	Vcc
OH/Fan Fail LED	○	○	Vcc
Power Fail LED	○	○	Vcc
Ground	○	○	Reset — Reset Button
Ground	○	○	Pwr — Power Button
	2	1	
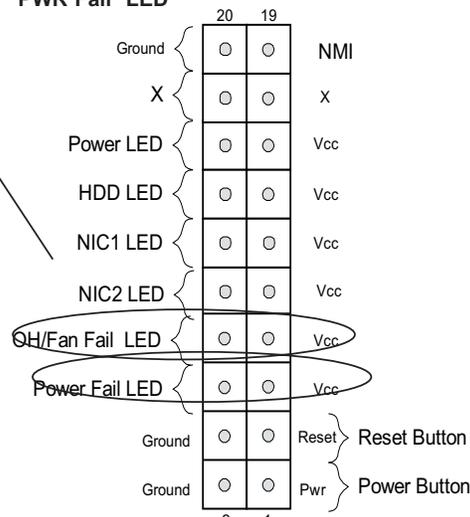
Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 4). To turn off the power when set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	+3V Standby
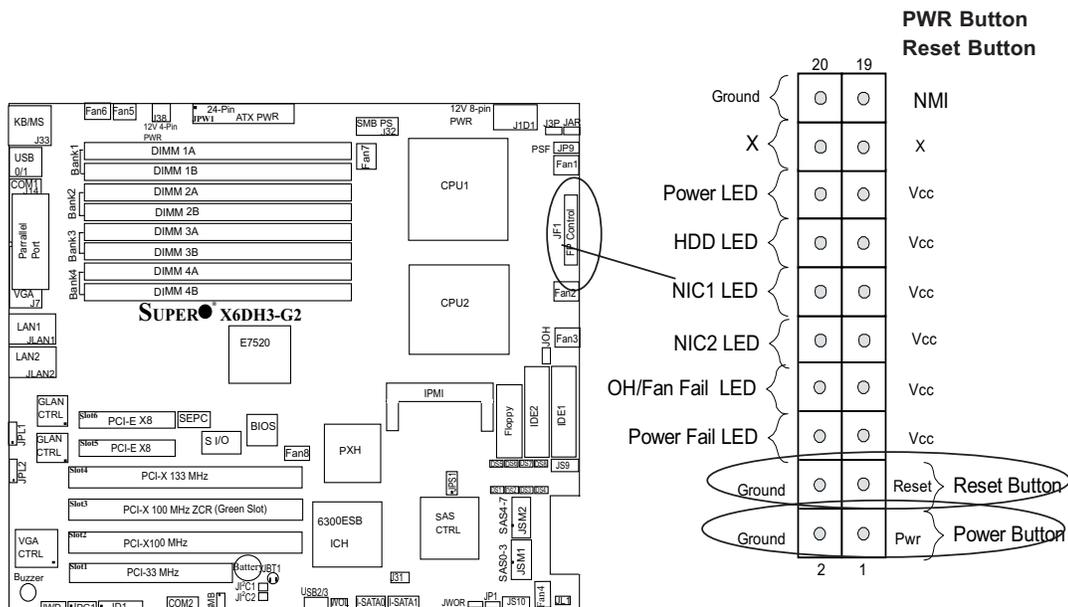
Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

Serial Ports

The COM1 serial port is located under the parallel port and COM2 is located below the PCI Slot1 (see the Motherboard layout on Page 1-4). See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)			
Pin #	Definition	Pin #	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port. NC indicates no connection.

Universal Serial Bus (USB)

There are two Universal Serial Bus ports (USB 0/1) located on the I/O back panel and additional two USB USB (2/3) located near the 6300 ESB chip (South Bridge) on the motherboard. These ports (FP USB2 and USB3) can be used to provide front side chassis access (cables not included). See the tables on the right for pin definitions.

Universal Serial Bus Pin Definitions			
USB 0/1 Pin #	Definition	(FP) USB 2/3 Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	N/A	5	Key

USB 0/1

FP USB 2/3

GLAN (Giga-bit Ethernet Ports)
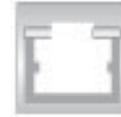
A G-bit Ethernet port (designated JLAN1/JLAN2) is located beside the VGA port on the IO backplane. This port accepts RJ45 type cables.

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located next to the rear USB ports at the corner of the mother-erboard . See the table at right for pin definitions. (See Figure 2-3 for the locations of each.)

PS/2 Keyboard and Mouse Port Pin Definitions	
Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

KB/Mouse
GLAN1
GLAN2
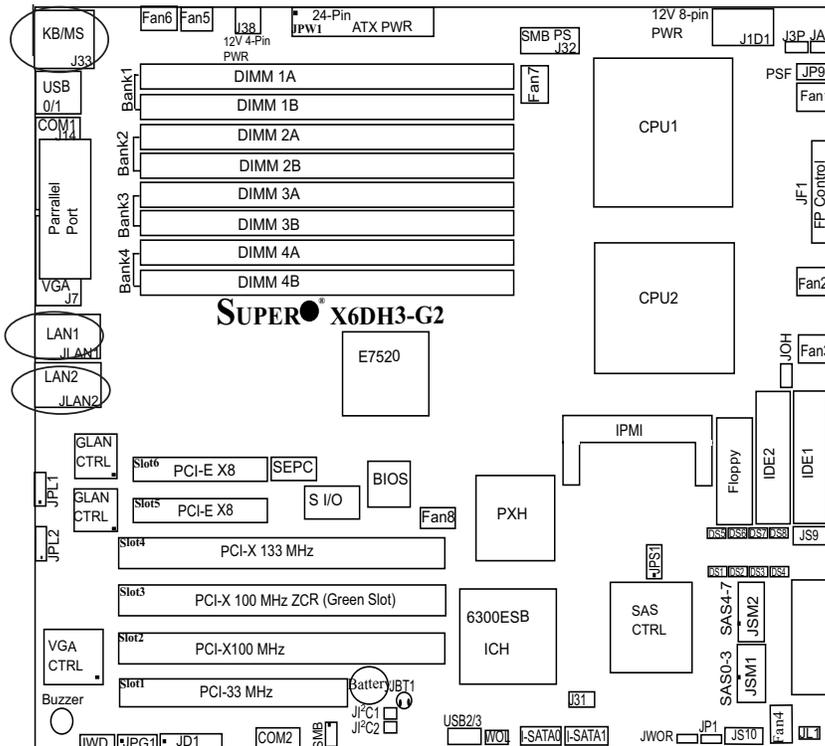
Fan Headers

The X6DH3-G2/X6DHi-G2 has eight fan headers (Fan1 to Fan8). (*Note: Fans 5-8 are 4-pin fans. However, Pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans.) See the table on the right for pin definitions. (*The onboard fan speeds are controlled by Thermal Management via BIOS--Hardware Monitor in the Advanced Setting. Note: Default: Disabled, When using Thermal Management setting, please use either all 3-pin fans or all 4-pin fans on the motherboard. Please do not mix 3-pin fans and 4-pin fans together on the same board.)

Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM_Control

Power LED/Speaker

On the JDI header, pins 1-3 are for a power LED. Connect a cable to pins 4-7 to use the external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector	
Pin Setting	Definition
Pins 6-7	Internal Speaker
Pins 4-7	External Speaker
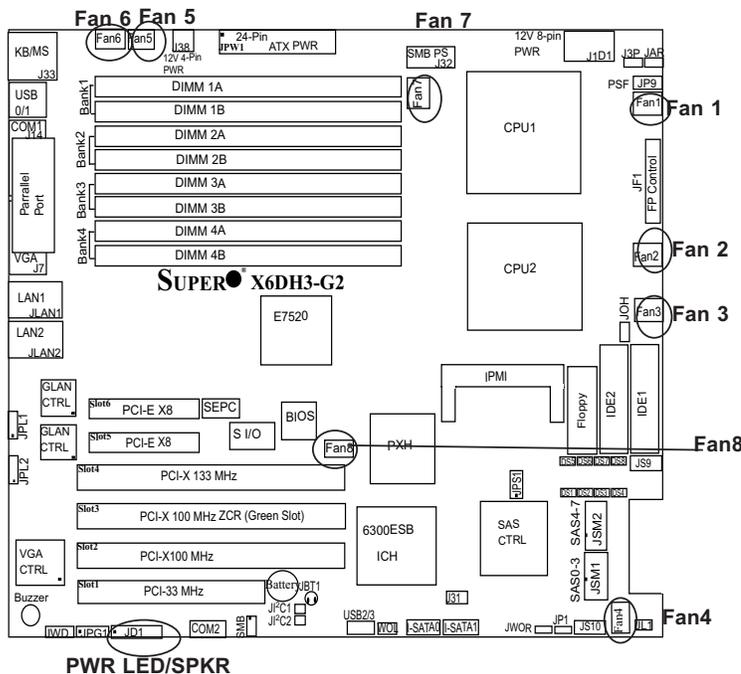
Wake-On-Ring

The Wake-On-Ring header is desig-
nated JWOR.This function allows your
computer to receive and "awakened"
by an incoming call to the modem
when in suspend state. See the table
on the right for pin definitions. You
must have a Wake-On-Ring card and
cable to use this feature.

Wake-On-Ring Pin Definitions (JWOR)	
Pin#	Definition
1	Ground (Black)
2	Wake-up

Wake-On-LAN

The Wake-On-LAN header is desig-
nated WOL. See the table on the right
for pin definitions. You must enable
the LAN Wake-Up setting in BIOS to
use this feature. You must also have
a LAN card with a Wake-on-LAN con-
nector and cable.

Wake-On-LAN Pin Definitions (JWOL)	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up
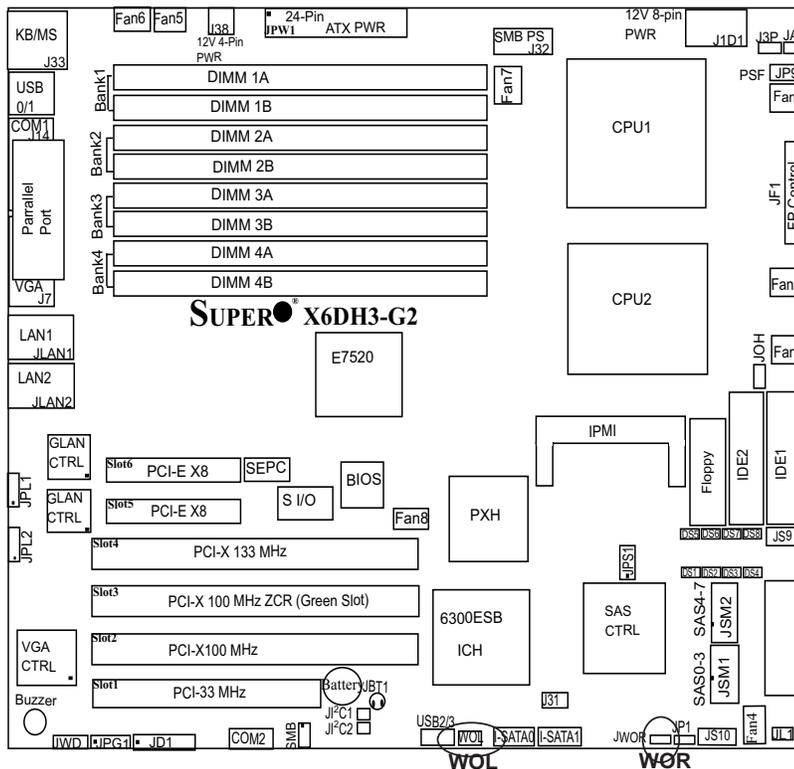
SMB

A System Management Bus header is located at J11. Connect the appropriate cable here to utilize SMB on your system. See the table on the right for pin definitions.

SMB Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

Power SMB (I^{2}C) Connector

Power SMB (I^{2}C) Connector (J32), located between the 8-pin PWR Connector and the 24-pin PWR Connector, monitors the status of PWR Supply, Fan and system temperature. See the table on the right for pin definitions.

PWR SMB Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

PWR SMB

Adaptec SAS Activity Output LED Header (*For the X6DH3-G2 only)

Adaptec SAS Activity Output LED Header (JS9), located next to IDE1, displays the status of Adaptec's SAS Activities. See the table on the right for pin definitions. (*Note: SAS Common LED will be activated when any of SAS0 to SAS7 LEDs is activated.)

* SAS_ACT_Output Pin Definitions			
Pin#	Definition	Pin#	Definition
1	SAS0:Act	6	SAS4:Act
2	SAS1:Act	7	SAS5:Act
3	SAS2:Act	8	SAS6:Act
4	SAS3:Act	9	SAS7:Act
5	*SAS Common	10	NC

Adaptec SAS SMB Power (I²C) Connector (*For the X6DH3-G2 only)

Adaptec SAS I²C Connector (JS10), located between SAS Slot#7 and Fan4, monitors the status of Power Supply System Management Bus for Adaptec's SAS ports.   See the table on the right for pin definitions.

SAS SMB PWR Pin Definitions	
Pin#	Definition
1	TWSI_SDA
2	Ground
3	TWSI_SCK

Overheat LED (JOH)

The JOH header is used to connect an LED to provide warning of chassis overheating. It is located near the microphone connector.   See the table on the right for pin definitions.

Overheat LED Pin Definitions	
Pin#	Definition
1	5vDC
2	OH Active

Power Supply Failure LED

Connect a cable from your power supply to the Power Supply Failure LED (PSF) header (JP9) to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin to indicate of a power failure on the chassis. See the table on the right for pin definitions.

Note: This feature is only available when using redundant Supermicro power supplies.

PWR Supply Fail LED Pin Definitions	
Pin#	Definition
1	PWR 1: Fail
2	PWR 2: Fail
3	PWR 3: Fail
4	Signal: Alarm Reset

2-6   Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

Connector Pins

```
3  2  1
●  ●  ■
```

Jumper

Setting

```
3  2  1
●  ●  ■
```
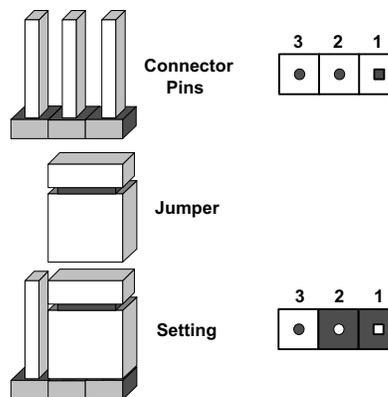
GLAN Enable/Disable

JPL1/JPL2 enables or disables the GLAN port(s) on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

GLAN Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

GLAN 1 Enable
GLAN 2 Enable
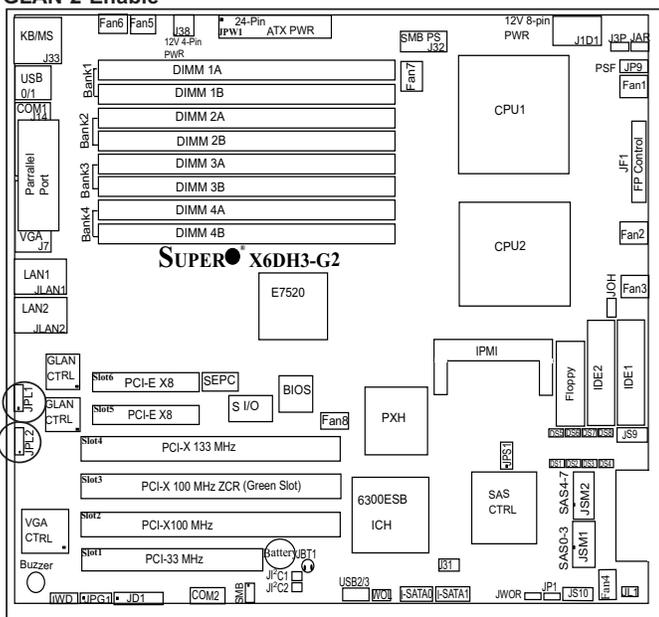
CMOS Clear

JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS.

Note: For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS. *Do not use the PW_ON connector to clear CMOS.*
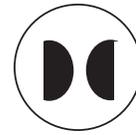
Watch Dog Enable

JWD controls Watch Dog, a system monitor that takes action when a software application hangs. Close pins 1-2 to reset the system if a program hangs. Close pins 2-3 to generate a non-maskable interrupt for the program that has frozen (requires software implementation). <u>Watch Dog must also be enabled in the BIOS.</u>

Watch Dog Jumper Settings (JWD)	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled
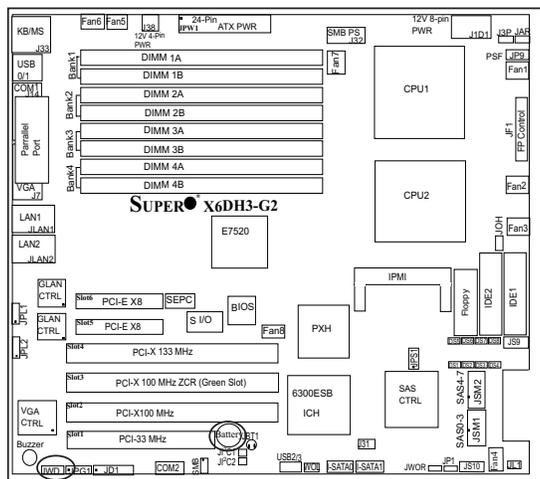
Watch Dog   **Clear CMOS**

VGA Enable/Disable

JPG1 enables or disables the VGA Connector on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

VGA Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Alarm Reset (JAR)

The system will notify you in the event of a power supply failure. This feature assumes that Supermicro redundant power supply units are installed in the chassis. If you only have a single power supply installed, you should not connect anything to this jumper to prevent false alarms. See the table on the right for jumper settings.

Alarm Reset Jumper Settings	
Pin#	Definition
2	+5V
1	Ground

SUPER● X6DH3-G2
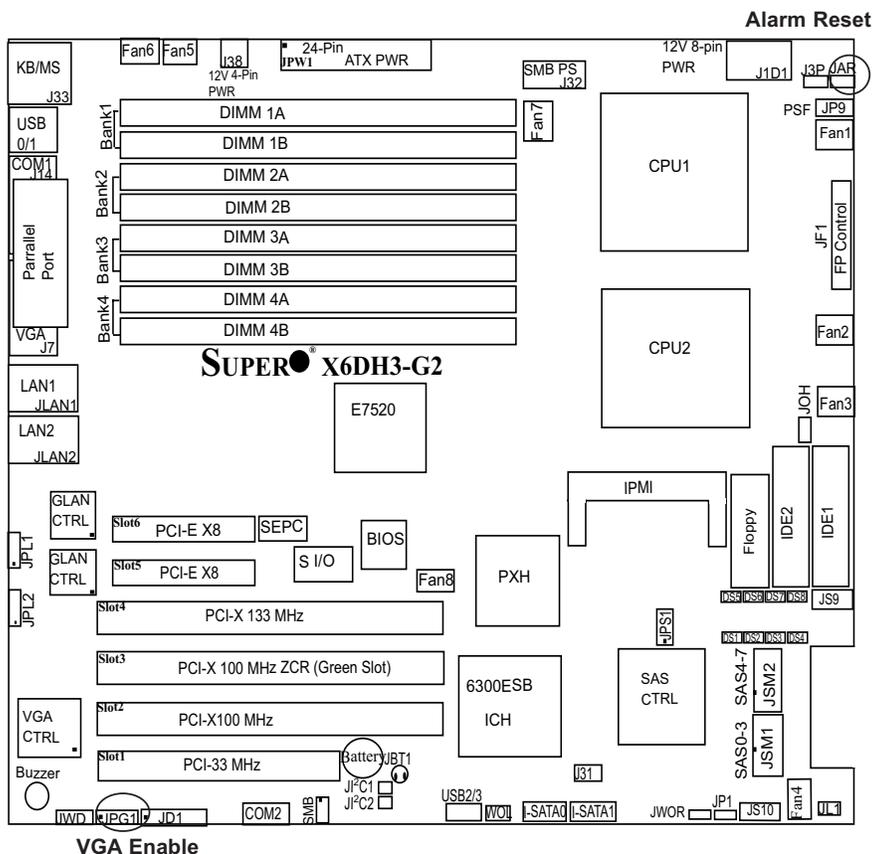
3rd PWR Supply PWR Fault Detect (J3P)

The system can notify you in the event of a power supply failure. This feature assumes that three power supply units are installed in the chassis, with one acting as a backup. If you only have one or two power supply units installed, you should disable this (the default setting) with J3P to prevent false alarms.

3rd PWR Supply PWR Fault Jumper Settings	
Jumper Setting	Definition
Closed	Enabled
Open	Disabled (*Default)

SAS Controller Enable (*For the X6DH3-G2 only)

JPS1 enables or disables the AIC 9140W Adaptec SAS Controller on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

SAS Controller Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled
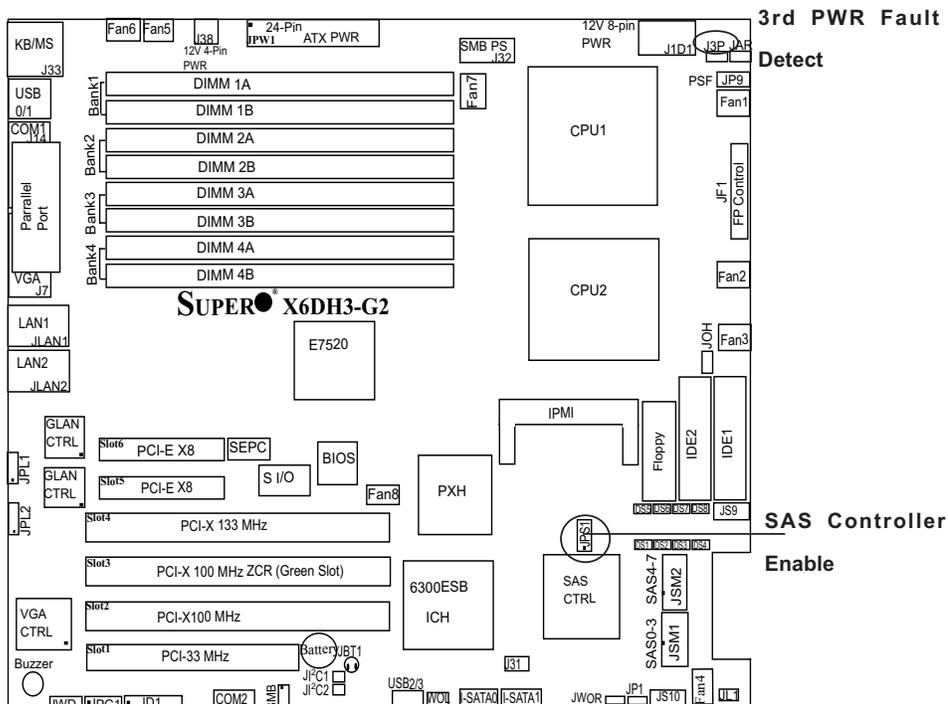
Power Force On Enable/ Disable

Jumper JP1 allows you to enable (force on) or disable the Power Force On function. If enabled, the power will always stay on automatically. If this function is disabled (the normal setting), the user needs to press the power button to power on the system.

Power Force On Enable/Disable Jumper Settings	
Jumper Setting	Definition
Open	Normal
Closed	Force On

PWR Force-On
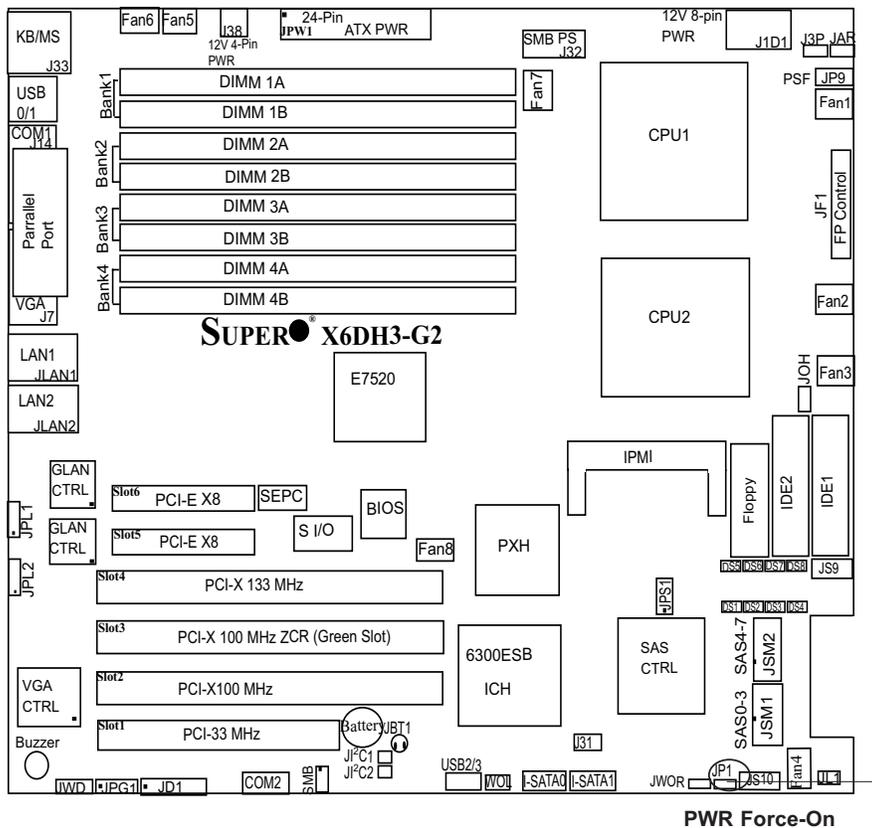
2-7   Onboard Indicators

GLAN LEDs

The Gigabit Ethernet LAN ports (located beside the Video port) has two LEDs. The yellow LED indicates activity while the other LED may be green, orange or off to indicate the speed of the connection. See the table at right for the functions associated with the second LED.

Link   Activity
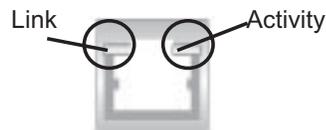
(Rear View: when facing the rear side of the system)

GLAN Left LED Connection Speed Indicator	
LED Color	Definition
Off	10Mbps or No Connection
Green	100 Mbps
Amber	1 Gbps

GLAN Right LED Connection Speed Indicator	
LED Color	Definition
Yellow	Flashing: 10Mbps/ 100Mbps/1 Gbps

GLAN 1
GLAN 2

SUPER® X6DH3-G2
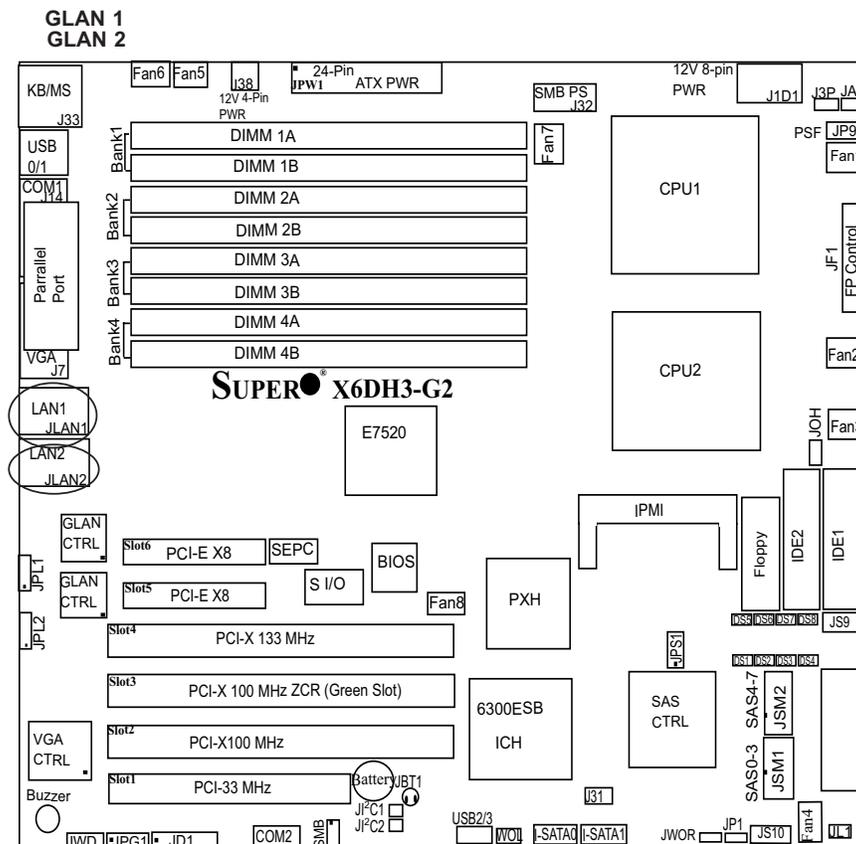
Adaptec SAS Activity LED Indicators (For the X6DH3-G2)

Adaptec SAS Activity LED Indicators (DS1-DS8), located next to the Adaptec SAS Ports 0-7, indicate the activity status of Adaptec SAS ports (0-7). See the table on the right for pin definitions.

SAS_ACT_Output Pin Definitions			
DS#	Definition	DS#	Definition
DS1	SAS0:Act	DS5	SAS4:Act
DS2	SAS1:Act	DS6	SAS5:Act
DS3	SAS2:Act	DS7	SAS6:Act
DS4	SAS3:Act	DS8	SAS7:Act

SAS Act_LED
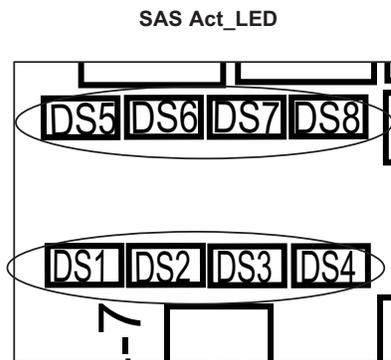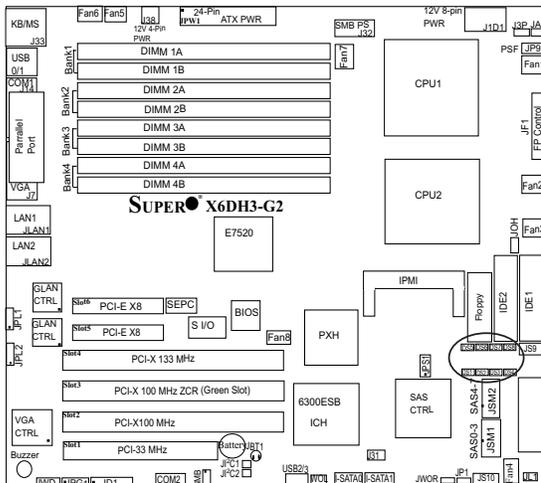
2-8   Parallel Port, Floppy, Hard Disk Drive and IPMI Connections

Note the following when connecting the floppy and hard disk drive cables:

• The floppy disk drive cable has seven twisted wires.

• A red mark on a wire typically designates the location of pin 1.

• A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Parallel (Printer) Port Connector

The parallel (printer) port is located above the COM1/VGA Connectors. See the table on the right for pin definitions.

Parallel (Printer) Port Connector Pin Definitions (J11)			
Pin#	Definition	Pin #	Definition
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	Write Data
23	PE	24	Write Gate
25	SLCT	26	NC

Parallel

Port
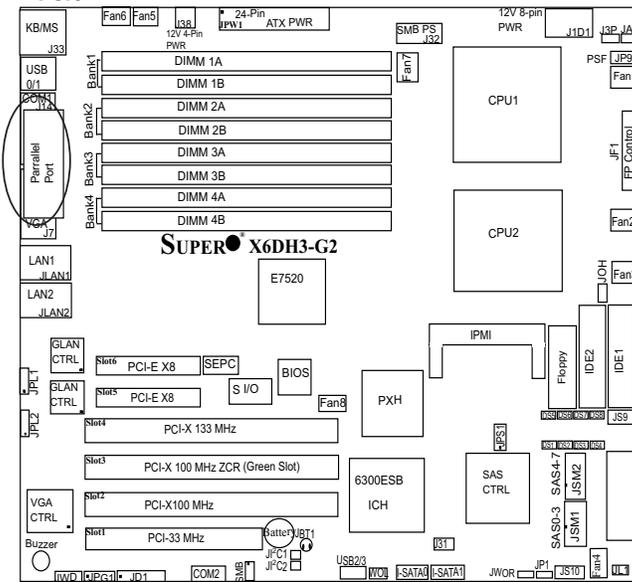
Floppy Connector

The floppy connector is located between the IDE connectors and the IPMI socket. See the table below for pin definitions.

IPMI

There is an IPMI 2.0 Socket on the motherboard. Refer to the layout below for the IPMI Socket location.

Floppy Drive Connector Pin Definitions (Floppy)			
Pin#	Definition	Pin #	Definition
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index
9	Ground	10	Motor Enable
11	Ground	12	Drive Select B
13	Ground	14	Drive Select B
15	Ground	16	Motor Enable
17	Ground	18	DIR
19	Ground	20	STEP
21	Ground	22	Write Data
23	Ground	24	Write Gate
25	Ground	26	Track 00
27	Ground	28	Write Protect
29	Ground	30	Read Data
31	Ground	32	Side 1 Select
33	Ground	34	Diskette
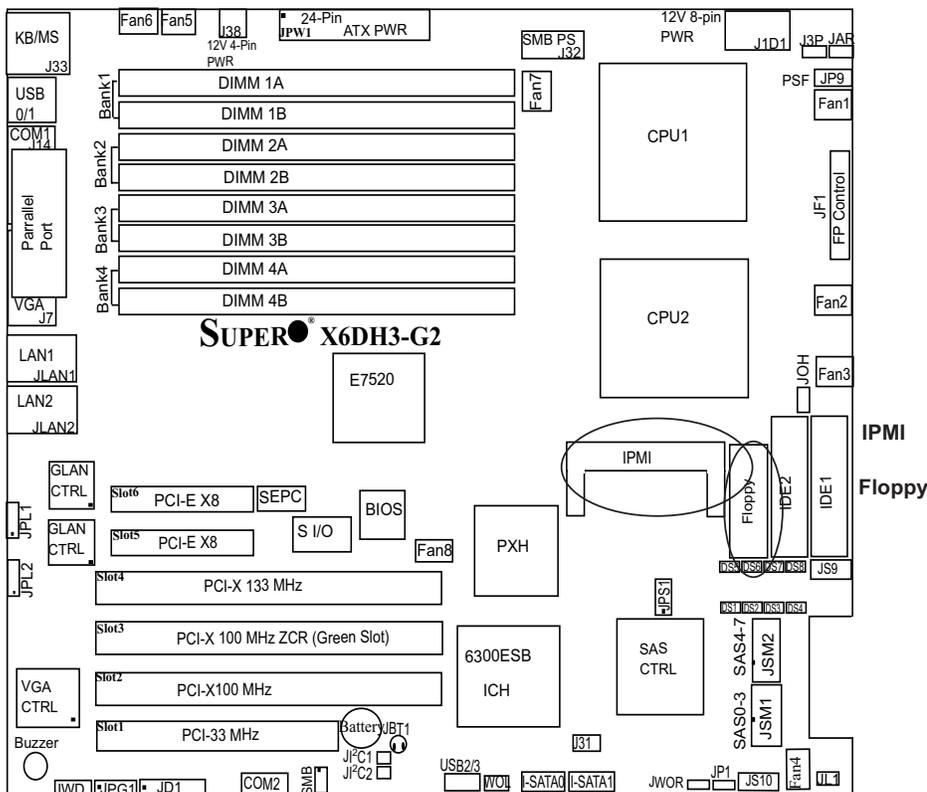
IDE Connectors

IDE Connectors are located next to the floppy drive on the motherboard. See the table on the right for pin definitions.

IDE Drive Connectors Pin Definitions (IDE)			
Pin#	Definition	Pin #	Definition
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DRQ3	22	Ground
23	I/O Write	24	Ground
25	I/O Read	26	Ground
27	IOCHRDY	28	BALE
29	DACK3	30	Ground
31	IRQ14	32	IOCS16
33	Addr1	34	Ground
35	Addr0	36	Addr2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	Ground
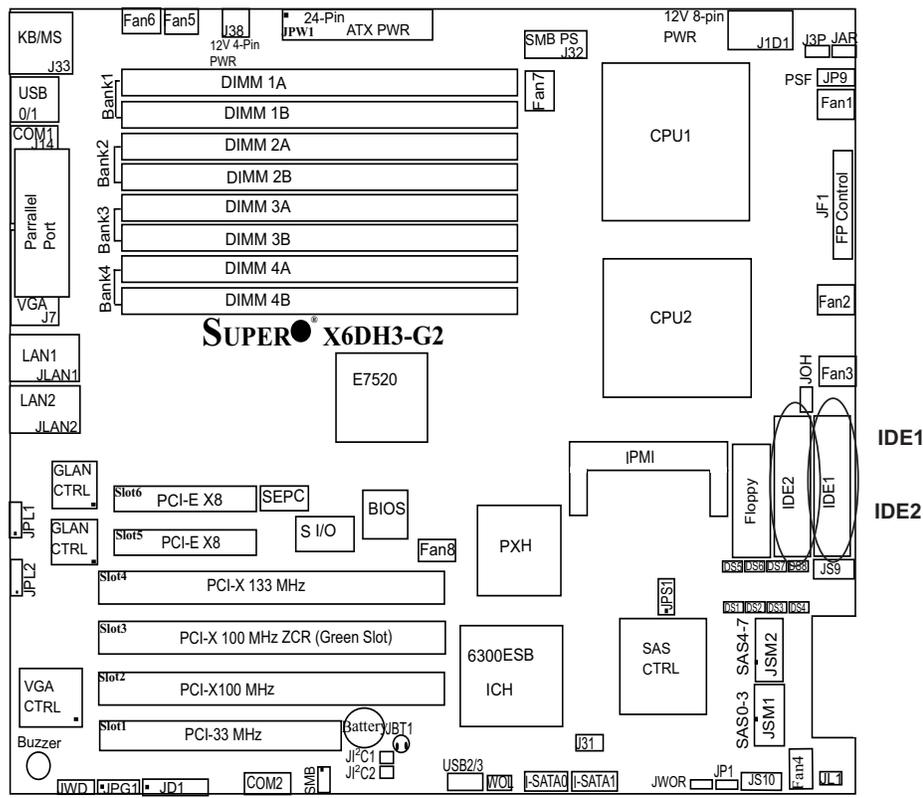
Notes

Chapter 3
Troubleshooting

3-1   Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter.

Note: Always disconnect the power cord before adding, changing or installing any hardware components.

Before Power On

1. Make sure that there is no short circuit between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install one CPU (-making sure it is fully seated) and connect the chassis speaker and the power LED to the motherboard. (Check all jumper settings as well.)
5. Use only the correct type of CMOS onboard battery as recommended by the Manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

No Power

1. Make sure that there is no short circuit between the motherboard and the chassis.
2. Verify that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on but you have no video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to the Appendix for details on beep codes.

NOTE

If you are a system integrator, VAR or OEM, a POST diagnostics
card is recommended. For I/O port 80h codes, refer to App. B.

Memory Errors

1. Make sure the DIMM modules are properly and fully installed.

2. Determine if different speeds of DIMMs have been installed on the motherboard
and verify that the BIOS setup is configured for the fastest speed of RAM
used. It is recommended to use the same RAM speed for all DIMMs in the
system.

3. Make sure you are using the correct type of Registered ECC DDR 2 400 (PC3200)
SDRAM (*Please refer to Page 2-5 for the instruction on DDR 2 400 DIMM
population and installation.)

4. Check for bad DIMM modules or slots by swapping a single module between
two slots and noting the results.

5. Make sure that all memory modules are fully seated in their slots. As an inter-
leaved memory scheme is used, you must install two modules of the same
speed and same type at a time, beginning with Bank 1, then Bank 2, and so
on (see Section 2-3).

6. Check the position of the 115V/230V switch on the power supply.

Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power
supply may cause the system to lose the CMOS setup information. Refer to
Section 1-6 for details on recommended power supplies.

2. The battery on your motherboard may be old. Check to verify that it still supplies
~3VDC. If it does not, replace it with a new one.

3. If the above steps do not fix the Setup Configuration problem, contact your
vendor for repairs.

3-2   Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, note
that as a motherboard manufacturer, Super Micro does not sell directly to end-us-
ers, so it is best to first check with your distributor or reseller for troubleshooting
services. They should know of any possible problem(s) with the specific system
configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Ques-
tion' (FAQ) sections in this chapter or see the FAQs on our web site (http://www.
supermicro.com/support/faqs/) before contacting Technical Support.

---

2. BIOS upgrades can be downloaded from our web site at (http://www.supermicro.com/support/bios/).

> **Note:** *Not all BIOS can be flashed; it depends on the modifications to the boot block code.*

3. If you still cannot resolve the problem, include the following information when contacting Super Micro for technical support:

•Motherboard model and PCB revision number

•BIOS release date/version (this can be seen on the initial display when your system first boots up)

•System configuration

An example of a Technical Support form is on our web site at (http://www.supermicro.com/support/contact.cfm).

4. Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com, by phone at:

(408) 503-8000, option 2, or by fax at (408)503-8019.

3-3   Frequently Asked Questions

Question: What are the various types of memory that my motherboard can support?

Answer: The X6DH3-G2/X6DHi-G2 has eight 240-pin DIMM slots that support registered ECC DDR 2 400 (PC3200) SDRAM modules. It is strongly recommended that you do not mix memory modules of different speeds and sizes. (*Please refer to Page 2-5 for the instruction on DDR 2 400 DIMM population and installation.)

Question: How do I update my BIOS?

Answer: It is recommended that you **do not** upgrade your BIOS if you are experiencing no problems with your system. Updated BIOS files are located on our web site at http://www.supermicro.com. Please check our BIOS warning message and the info on how to update your BIOS on our web site. Also, check the current BIOS revision and make sure it is newer than your BIOS before downloading. Select your motherboard model and download the BIOS file to your computer. Unzip the BIOS update file and you will find the readme.txt (flash instructions), the phlash.exe (BIOS flash utility), the platform.bin (platform file) and the BIOS image (xxxxxx.rom) files. Copy these files into a bootable floppy and reboot your system. Then, follow Readme.txt to continue flashing the BIOS.

(***Warning**: Do not shut down or reset the system while updating BIOS to prevent possible system boot failure!)

Question: What's on the CD that came with my motherboard?

Answer: The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for the Windows OS, security and audio drivers.

3-4   Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Chapter 4
BIOS

4-1   Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the X6DH3-G2/X6DHi-G2. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <http://www.supermicro.com> for any changes to the BIOS that may not be reflected in this manual.

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The Phoenix BIOS flash chip stores the system parameters, types of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a backup battery provides power to the BIOS flash chip, enabling it to retain system parameters. Each time the computer is powered on, the computer is configured with the values stored in the BIOS ROM by the system BIOS, which gains control at boot-up.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot. See below.

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 4-3, detailed descriptions are given for each parameter setting in the Setup utility.

Warning: Do not shut down or reset the system while updating the BIOS to prevent possible boot failure.

4-2   Running Setup

*Default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (See the next page.)

When you first turn on the computer, the Phoenix BIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

  1.   By pressing <Delete> immediately after turning the system on, or

  2.   When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

4-3   Main BIOS Setup

All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶icon. With the item highlighted, press the <Enter> key to access the submenu.

Main BIOS Setup Menu

```
        PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
   Main    Advanced   Security    Boot    Exit

                                                          Item Specific Help
     System Time:                 [11:42:57]
     System Date:                 [03-17-2004]
                                                      <Tab>, <Shift-Tab>, or
     BIOS Date                                        <Enter> selects field.
     Legacy Diskette A:           [1.44/1.25 MB  3½"]

     Parallel ATA:                [Both]
     Serial ATA:                  [Enabled]
     SATA RAID Enable             [Disabled]
     Native Mode Operation:       [Auto]

   ▶ IDE Channel 0 Master
   ▶ IDE Channel 0 Slave
   ▶ IDE Channel 1 Master
   ▶ IDE Channel 1 Slave
   ▶ IDE Channel 2 Master
   ▶ IDE Channel 3 Master

     System Memory:               [XXXX KB]
     Extended Memory:             [XXXX KB]


   F1  Help  ↑↓ Select Item   -/+   Change Values   F9   Setup Defaults
   Esc Exit  ↔  Select Menu   Enter Select ▶ Sub-Menu  F10 Previous Values
```

Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields, and enter the correct data. Press the <Enter> key to save the data.

BIOS Date

This field displays the date when this version of BIOS was built.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

Parallel ATA

This setting allows the user to enable or disable the function of Parallel ATA. The options are Disabled, Channel 0, Channel 1 and **Both.**

Serial ATA

This setting allows the user to enable or disable the function of Serial ATA. The options are Disabled and **Enabled.**

Serial ATA RAID Enable

Select Enable to enable Serial ATA RAID Functions. (*For the Windows OS environment, use the RAID driver if this feature is set to Enabled. If set to **Disabled**, use the Non-RAID driver.)

Native Mode Operation

Select the native mode for ATA. The options are: Parallel ATA, Serial ATA, Both, and **Auto**.

▶IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master

These settings allow the user to set the parameters of IDE Channel 0 Master/ Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:

```
        PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
   Main

                                                       Item Specific Help
    Type:
    CHS Format
    Cylinders:                                  User = you enter
    Cylinders:                                  parameters of hard-disk
    Heads:                      [  1]           drive installed at this
    Heads:                                      connection.
    Sectors:                                    Auto = autotypes
    Sectors:                                    hard-disk drive
    Maximum Capacity:                           installed here.
    Maximum Capacity:                           1-39 = you select
    LBA Format                                  pre-determined  type of
    Total Sectors:                              hard-disk drive
    Maximum Capacity:                           installed here.
                                                CD-ROM = a CD-ROM drive
                                                is installed here.
    Multi-Sector Transfers:     [Disabled]      ATAPI Removable =
    LBA Mode Control:           [Disabled]      removable disk drive is
    32 Bit I/O:                 [Disabled]      installed here.
    Transfer Mode:              [Standard]
    Ultra DMA Mode:             [Disabled]



    F1  Help  ↑↓ Select Item   -/+   Change Values    F9  Setup Defaults
    Esc Exit  ↔  Select Menu   Enter Select ▶ Sub-Menu  F10 Previous Values
```

Type

This feature allows the user to select the type of IDE hard drive. Select **Auto** to allow the BIOS to automatically determine the hard drive's capacity, number of heads, etc.). Enter a number from 1-39 to select a predetermined type of hard drive, CDROM and ATAPI Removable. Select User to allow the user to enter the parameters of the HDD installed at this connection. Select CDROM if a CDROM drive is installed. Select ATAPI if a removable disk drive is installed.

CHS Format

The following items will be displayed by the BIOS:

TYPE: This item displays the type of CPU.

Cylinders: This item indicates the status of Cylinders.

Headers: This item indicates the number of headers.

Sectors: This item displays the number of sectors.

Maximum Capacity: This item displays the maximum storage capacity of the system.

LBA Format

The following items will be displayed by the BIOS:

Total Sectors: This item displays the number of total sectors available in the LBA Format.

Maximum Capacity: This item displays the maximum capacity in the LBA Format.

Multi-Sector Transfer

This item allows the user to specify the number of sectors per block to be used in multi-sector transfer. The options are Disabled, 4 Sectors, 8 Sectors and **16 Sectors**.

LBA Mode Control

This item determines whether the Phoenix BIOS will access the IDE Channel 0 Master Device via the LBA mode. The options are **Enabled** and Disabled.

32 Bit I/O

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

Transfer Mode

Selects the transfer mode. The options are Standard, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.

Ultra DMA Mode

Selects Ultra DMA Mode. The options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4 and Mode 5.

System Memory

This display informs you how much system memory is recognized as being present in the system.

Extended Memory

This display informs you how much extended memory is recognized as being present in the system.

4-4   Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All Advanced BIOS Setup options are described in this section.

```
        PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
  Main   Advanced   Security   Boot   Exit
 ┌─────────────────────────────────────────────────┬──────────────────────────┐
 │                                                  │    Item Specific Help    │
 │ ▶ Boot Features                                  ├──────────────────────────┤
 │ ▶ Memory Cache                                   │                          │
 │ ▶ PCI Configuration                              │   Select Boot features   │
 │ ▶ Advanced Chipset Control                       │                          │
 │ ▶ Advanced Processor Options                     │                          │
 │ ▶ I/O Device Configuration                       │                          │
 │ ▶ DMI Event Logging                              │                          │
 │ ▶ Console Redirection                            │                          │
 │ ▶ Hardware Monitor                               │                          │
 │                                                  │                          │
 │                                                  │                          │
 │                                                  │                          │
 │                                                  │                          │
 │                                                  │                          │
 │                                                  │                          │
 ├──────────────────────────────────────────────────────────────────────────┤
 │ F1  Help  ↑↓ Select Item   -/+   Change Values   F9  Setup Defaults        │
 │ Esc Exit  ↔  Select Menu   Enter Select ▶ Sub-Menu  F10 Previous Values    │
 └──────────────────────────────────────────────────────────────────────────┘
```

▶**Boot Features**

Access the submenu to make changes to the following settings.

Quick Boot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

Quiet Boot

This setting allows you to Enable or **Disable** the diagnostic screen during boot-up.

ACPI Mode

Use the setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system. The options are **Yes** and No.

Power Button Behavior

If set to **Instant-Off**, the system will power off immediately as soon as the user hits the power button. If set to 4-sec., the system will power off when the user presses the power button for 4 seconds or longer. The options are instant-off and 4-sec override.

Resume On Modem Ring

Select On to "awaken your system" when an incoming call is received by your modem. The options are On and **Off**.

Power Loss Control

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Stay Off, Power On and **Last State**.

Watch Dog

If enabled, this option will automatically reset the system if the system is not active for more than 5 minutes. The options are Enabled and **Disabled**.

Summary Screen

This setting allows you to **Enable** or Disable the summary screen which displays the system configuration during bootup.

▶Memory Cache

Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS to write (cache) its data into this reserved memory area. Select **Write Protect** to enable this function, and this area will be reserved for BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS to write (cache) its data into this reserved memory area. Select **Write Protect** to enable this function, and this area will be reserved for Video BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in the Static DRM (SDROM) or to be written into L1, L2 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 0-512K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the Static DRM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 512K-640K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DRM (SDROM)

or written into L1, L2, L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the extended memory area above 1MB. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Discrete MTRR Allocation

If enabled, MTRRs (-Memory Type Range Registers) are configured as distinct, separate units and cannot be overlapped. If enabled, the user can achieve better graphic effects when using a Linux graphic driver that requires the write-combining configuration with 4GB or more memory. The options are Enabled and **Disabled**.

▶PCI Configuration

Access the submenu to make changes to the following settings for PCI devices.

Onboard GLAN1/Onboard GLAN2 (Gigabit- LAN) OPROM Configure

Enabling this option provides the capability to boot from GLAN. The options are Disabled and **Enabled**.

Onboard SCSI OPROM Configure

Enabling this option provides the capitally to boot from SCSI HDD. The options are Disabled and **Enabled**.

Default Primary Video Adapter

This item allows the user to select the Primary Video Adapter between two adapters instead of selecting among three or more adapters. The options are Other and **Onboard Video**.

PCI Parity Error Forwarding

Enable this item to forward the PCI errors occurring behind P2P bridges to the South Bridge, so NMI can be asserted. The options are Enabled and **Disabled**.

ROM Scan Ordering

This feature allows the user to decide which Option ROM to be activated first. The options are **Onboard first** and Add-On first.

Reset Configuration Data

If set to Yes, this setting clears the Extended System Configuration Data- (ESCD) area. The options are Yes and **No**.

Frequency for Slot#2-Slot#3/MASS, Frequency for PCI-X Slot#4 (Note: MASS=Mass Storage Devices: SATA, SAS and SCSI. SAS is for the X6DH3-G2 only.)

This option allows the user to change the bus frequency for the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, and PCI-X 100 MHz.

Frequency for PCI-X#1 On Riser, Frequency for PCI-X#2-#3 On Riser (*Available when a 2U Active Riser Card is present.)

This option allows the user to change the bus frequency of the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

▶PCI 33MHz Slot#1, PCI-X 100MHz Slot#2, PCI-X 100MHz ZCR Slot#3, PCI-X 133MHz Slot#4, PCI-Exp x8 Slot#5, PCI-Exp x8 Slot#5, PCI-Exp x8 Slot#6 (or PCI-Exp x8 Slot#6 and Riser, if a 2U Active Riser Card is present.)

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are Enabled and **Disabled**.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novell and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. a different operating system requires a different Bus Master clock rate**.**

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or Other (for Unix, Novelle NetWare and other operating systems).

▶Advanced Chipset Control

Access the submenu to make changes to the following settings.

Force Compliance Mode

This feature allows you to enable the PCI-Express Compliance Mode. The options are **Disabled** and Enabled.

Memory RAS Feature Control

Select this option in order to enable the special feature of DIMM sparing or memory mirroring. The options are Mirroring, Sparing and **Standard**.

Clock Spectrum Feature

If "Enabled", the BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and **Disabled**.

Memory Remap Function Control

PCI memory resources will overlap with the physical memory if 4GB of memory or above is installed on the motherboard. When this occurs, **enable** this function to reallocate the overlapped physical memory to a location above 4GB to resolve the memory overlapping situation.

Delayed Transaction Discard

Select **Disabled** to set the ESB P2P Bridge Secondary Discard Timer to 32 micro-seconds for the PCI-32 bus. Select Enabled to set the ESB P2P Bridge Secondary Discard Timer to 4 micro-seconds for the PCI-32 bus.

DRAM Data Integrity Mode

If enabled, this feature allows the data stored in the DRAM memory to be integrated for faster data processing. The options are 72-bit ECC, 144-bit ECC, **Auto** and Disabled.

ECC Error Type

This setting lets you select which type of interrupt to be activated as a result of an ECC error. The options are **None**, NMI (Non-Maskable Interrupt), SMI (System Management Interrupt) and SCI (System Control Interrupt.)

SERR Signal Condition

This setting specifies the ECC Error conditions that an SERR# is to be asserted. The options are None, **Single Bit**, Multiple Bit and Both.

Enabling Multi-Media Timer

Select Yes to activate a set of timers that are alternative to the traditional 8254 timers for the OS use. The options are Yes and **No**.

USB Function

Select Enabled to enable the function of USB devices specified. The settings are **Enabled** and Disabled.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

▶Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

This is a display that indicates the speed of the installed processor.

Hyper-threading (*Available when supported by the CPU.)

Set to Enabled to use the Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled or **Enabled.**

Machine Checking (*Available when supported by the CPU.)

Set to Enabled to activate the function of Machine Checking and allow the CPU to detect and report hardware (machine) errors via a set of model-specific registers (MSRs). The options are Disabled or **Enabled**.

C1 Enhanced Mode (*Available when supported by the CPU.)

Set to Enabled to enable Enhanced Halt State to lower CPU voltage/frequency to prevent overheat. The options are Enabled and **Disabled**. (**Note:** please refer to Intel's web site for detailed information.)

No Execute Mode Memory Protection (*Available when supported by the CPU and the OS.)

Set to **Enabled** to enable Execute Disable Bit and allow the processor to classify areas in memory where an application code can execute and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes to overwhelm the processor or damage the system during an attack.

(*Note: this feature is available when your OS and your CPU support the function of Execute Disable Bit.) The options are Disabled and **Enabled**. (Note: For more information regarding hardware/software support for this function, please refer to Intel's and Microsoft's web sites.)

Thermal Management 2 (*Available when supported by the CPU.)

Set to Enabled to use Thermal Management 2 (TM2) which will lower CPU voltage and frequency when the CPU temperature reaches a pre-defined overheat threshold. Set to **Disabled** to use Thermal Manager 1 (TM1), allowing CPU clocking to be regulated via CPU Internal Clock modulation when the CPU temperature reaches the overheat threshold.

Adjacent Cache Line Prefetch (*Available when supported by the CPU.)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are Disabled and **Enabled**.

Processor Power Management

This feature allows the user to determine the processor power management mode. The options are **Disabled** and C States Only. If set to Disabled, C States and GV1/GV3 are disabled. If set to C States only, the processor power will be controlled through CPU power states in the APCI setting.

▶I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock Input

This setting allows you to select clock frequency for KBC. The options are 6MHz, 8MHz, **12MHz** and 16MHz.

Onboard COM 1

This setting allows you to assign control of Serial Port A. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Base I/O Address

Select the base I/O address for Serial Port A. The options are **3F8**, 2F8, 3E8 and 2E8.

Interrupt

Select the IRQ (interrupt request) for Serial Port A. The options are IRQ3 and **IRQ4**.

Onboard COM 2

This setting allows you to assign control of Serial Port B. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Mode

Specify the type of device that will be connected to Serial Port B. The options are **Normal**, and IR (for an infrared device).

Base I/O Address

Select the base I/O address for Serial Port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

Select the IRQ (interrupt request) for Serial Port B. The options are **IRQ3** and IRQ4.

Parallel Port

This setting allows you to assign control of the parallel port. The options are **Enabled** (user defined), Disabled and Auto (BIOS-or OS- controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **378**, 278 and 3BC.

Interrupt

Select the IRQ (interrupt request) for the parallel port. The options are IRQ5 and **IRQ7**.

Mode

This feature allows you to specify the parallel port mode. The options are Output only, Bi-Directional, EPP and **ECP**.

DMA Channel

This item allows you to specify the DMA channel for the parallel port. The options are DMA1 and **DMA3**.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled, and Auto (BIOS and OS controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **Primary** and Secondary.

▶DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display to inform you of the event log validity. It is not a setting.

Event Log Capacity

This is a display to inform you of the event log capacity. It is not a setting.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and **No**.

▶**Console Redirection**

Access the submenu to make changes to the following settings.

COM Port Address

This item allows you to specify which COM port to direct the remote console to: Onboard COM A or Onboard COM B. This setting can also be **Disabled**.

BAUD Rate

This item allows you to set the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K, and 115.2K.

Console Type

This item allows you to set console redirection type. The options are VT100, VT100,8bit, PC-ANSI, 7bit, **PC ANSI**, VT100+, VT-UTF8 and ASCII.

Flow Control

This item allows you to select the flow control option for the console. The options are: None, XON/XOFF, and **CTS/RTS**.

Console Connection

This item allows you to decide how console redirection is to be connected: either **Direct** or Via Modem.

Continue CR after POST

Choose whether to continue with console redirection after the POST routine. The options are On and **Off**.

▶Hardware Monitor Logic

CPU Temperature Threshold

This option allows the user to set a CPU temperature threshold that will activate the alarm system when the CPU temperature reaches this pre-set temperature threshold. The options are 70°C, 75°C, **80°C** and 85°C.

Highlight this and hit <Enter> to see monitor data for the following items:

CPU1 Temperature

CPU2 Temperature

System Temperature

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. If the option is set to 3-pin fan, the fan speed is controlled by voltage. If the option is set to 4-pin, the fan speed will be controlled by Pulse Width Modulation (PWM). Select 3-pin if your chassis came with 3-pin fan headers. Select 4-pin if your chassis came with 4-pin fan headers. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select Disable to disable the fan speed control function to allow the onboard fans to run at the full speed (12V) at all the time. The Options are: **1. Disable**, 2. 3-pin (Server), 3. 3-pin (Workstation), 4. 4-pin (Server) and 5. 4-pin (Workstation).

CHFan 1-CHFAN8: If the feature of Auto Fan Control is enabled, the BIOS will automatically display the status of the fans indicated in this item.

Vcore A/Vcore B

P3V3

P5V

N12V

P12V

VDD

P5Vsb

*Note: In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

4-5   Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.

```
       PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
   Main    Advanced    Security    Boot    Exit

                                                    Item Specific Help
    Supervisor Password Is:
    User Password Is:

    Set Supervisor Password
    Set User Password

    Fixed disk boot sector:        [Normal]
    Password on boot:              [Disabled]












   F1   Help   ↑↓ Select Item    -/+    Change Values      F9   Setup Defaults
   Esc  Exit   ↔ Select Menu   Enter Select ▶ Sub-Menu   F10 Previous Values
```
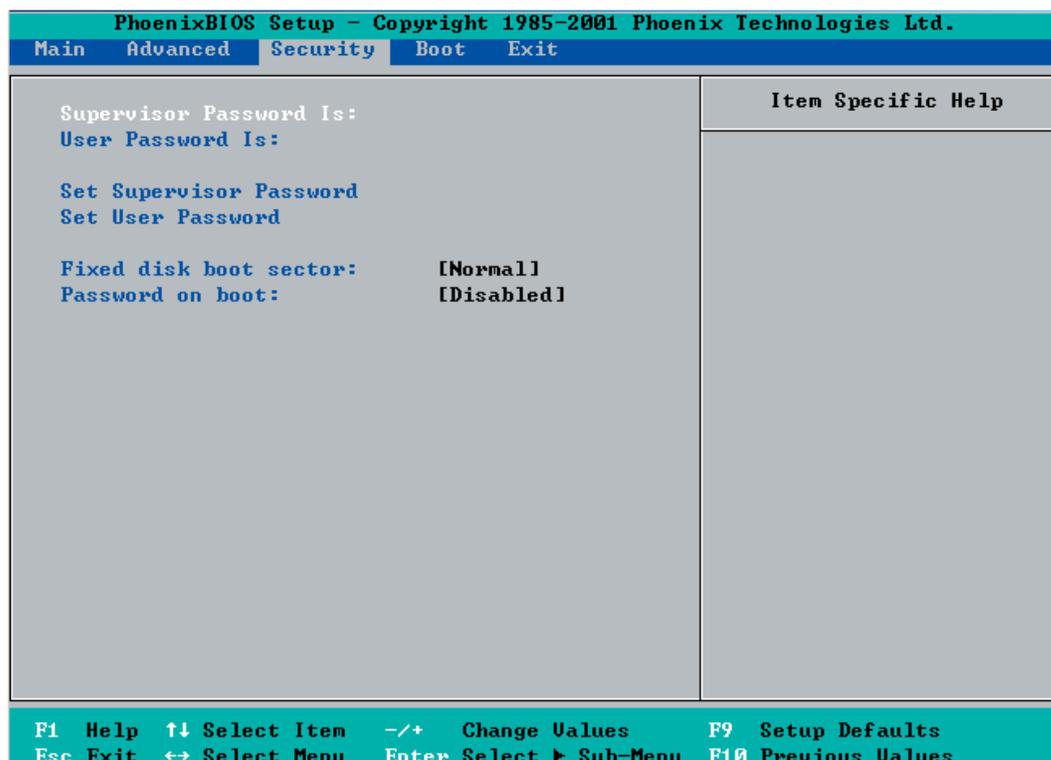
Supervisor Password Is:

This feature indicates if a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is:

This feature indicates if a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to the BIOS.

Set User Password

When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Fixed Disk Boot Sector

This setting may offer some protection against viruses when set to Write Protect, which protects the boot sector on the hard drive from having a virus written to it. The other option is **Normal**.

Password on Boot

If set to Enabled, a password is required for a user to enter the system at system boot. The options are Enabled (password required) and Disabled (password not required).

4-6   Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Highlighting a setting with a + or - will expand or collapse that entry. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

```
          PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
   Main    Advanced    Security    Boot    Exit

                                                          Item Specific Help
      +Removable Devices
       CD-ROM Drive
      +Hard Drive                                    <Tab>, <Shift-Tab>, or
                                                     <Enter> selects field.














   F1  Help   ↑↓ Select Item   -/+   Change Values    F9   Setup Defaults
   Esc Exit   ↔ Select Menu  Enter Select ▶ Sub-Menu  F10 Previous Values
```
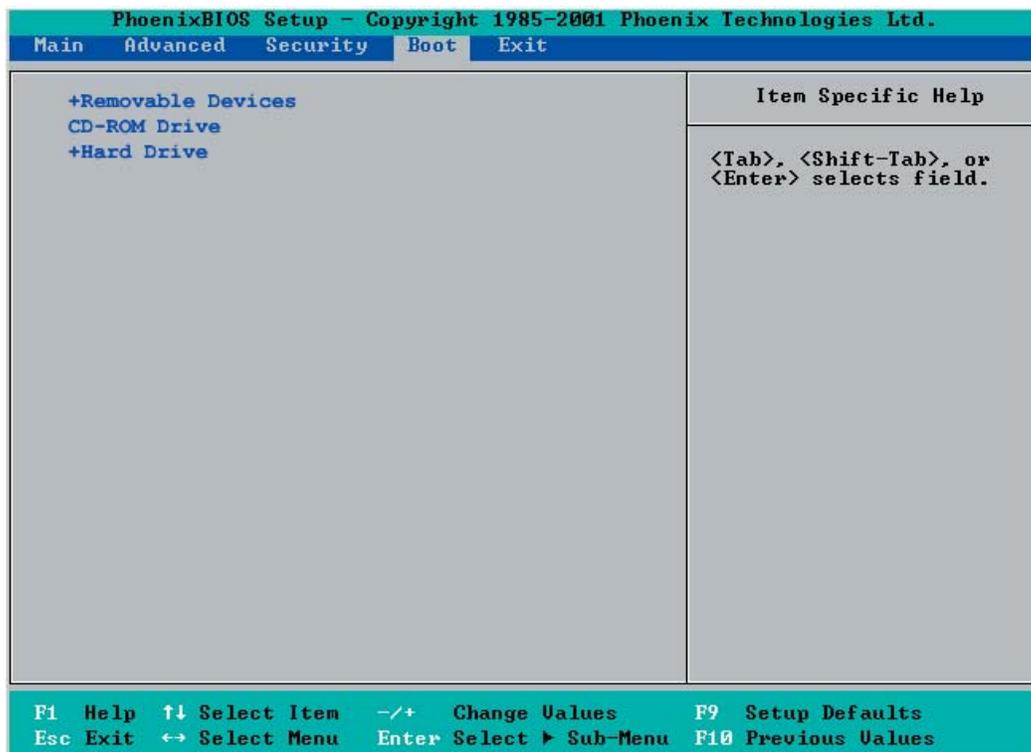
+Removable Devices

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of devices in the Item Specific Help window.

CDROM Drive

See details on how to change the order and specs of the CDROM drive in the Item Specific Help window.

+Hard Drive

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of hard drives in the Item Specific Help window.

4-7   Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys.
You should see the following display. All Exit BIOS settings are described in this
section.

```
PhoenixBIOS Setup   Copyright 1985-2001 Phoenix Technologies Ltd.
  Main     Advanced    Security    Boot    Exit

                                                    Item Specific Help
     Exit Saving Changes
     Exit Discarding Changes
                                               Exit System Setup and
     Load Setup Defaults                       save your changes to
     Discard Changes                           CMOS.
     Save Changes




  F1   Help   ↑↓ Select Item    -/+    Change Values    F9   Setup Defaults
  Esc  Exit   ←→ Select Menu   Enter  Select ▶ Sub-Menu  F10  Previous Values
```
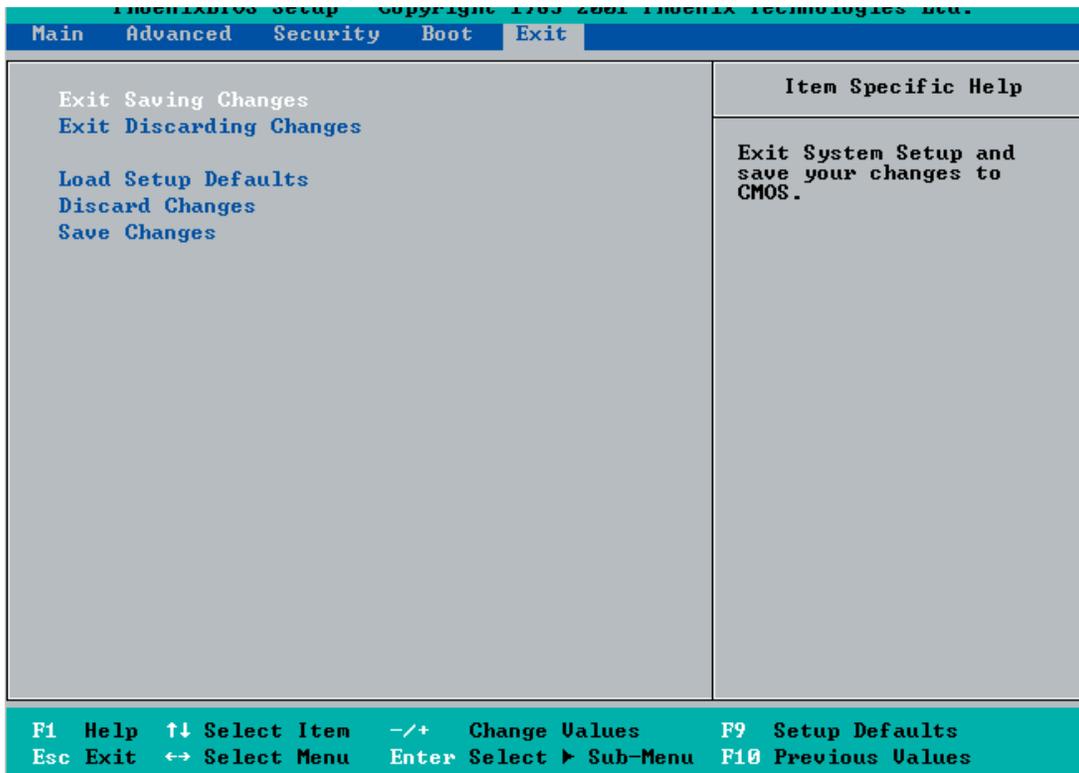
Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the
BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any
changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the
BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made.
You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain
in the Setup utility.

NOTES

Appendix A
BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

Failure Fixed Disk

Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

Stuck key

Stuck key on keyboard.

Keyboard error

Keyboard not working.

Keyboard Controller Failed

Keyboard controller failed test. May require replacing keyboard controller.

Keyboard locked - Unlock key switch

Unlock the system to proceed.

Monitor type does not match CMOS - Run SETUP

Monitor type not correctly identified in Setup

Shadow Ram Failed at offset: nnnn

Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

System RAM Failed at offset: nnnn

System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

Extended RAM Failed at offset: nnnn

Extended memory not working or not configured properly at offset **nnnn.**

System battery is dead - Replace and run SETUP

The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

System CMOS checksum bad - Default configuration used

System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error

The timer test failed. Requires repair of system board.

Real time clock error

Real-Time Clock fails BIOS hardware test. May require board repair.

Check date and time settings

BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

Previous boot incomplete - Default configuration used

Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.

Memory Size found by POST differed from CMOS

Memory size found by POST differed from CMOS.

Diskette drive A error
Diskette drive B error

Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

Incorrect Drive A type - run SETUP

Type of floppy drive A: not correctly identified in Setup.

Incorrect Drive B type - run SETUP

Type of floppy drive B: not correctly identified in Setup.

System cache error - Cache disabled

RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

CPU ID:

CPU socket number for Multi-Processor error.

EISA CMOS not writeable

ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed

ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

Software NMI Failed

ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Fail-Safe Timer NMI Failed

ServerBIOS2 test error: Fail-Safe Timer takes too long.

device Address Conflict

Address conflict for specified **device.**

Allocation Error for: device

Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive

CD ROM Drive identified.

Entering SETUP ...

Starting Setup program

Failing Bits: nnnn

The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n

Fixed disk **n** (0-3) identified.

Invalid System Configuration Data
Problem with NVRAM (CMOS) data.

I/O device IRQ conflict
I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:
PS/2 Mouse installed.

nnnn kB Extended RAM Passed
Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed
Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed
Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed
Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu
There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found
Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.

Parity Check 1 nnnn
Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.** Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.

Parity Check 2 nnnn
Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.**

Press <F1> to resume, <F2> to Setup, <F3> for previous

Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup

Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:

PS/2 mouse identified.

Run the I2O Configuration Utility

One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed

System BIOS copied to shadow RAM.

UMB upper limit segment address: *nnnn*

Displays the address *nnnn* of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed

Video BIOS successfully copied to shadow RAM.

Notes

Appendix B
BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the PhoenixBIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and two short beeps - video configuration error

1 continuous long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen. The following is a list of codes that may be written to port 80h.

POST Code	Description
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Initialize PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line *xxxx**
2Eh	1-3-4-3 RAM failure on data bits *xxxx** of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
47h	Initialize I20 support
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt "Press F2 to enter SETUP"
5Bh	Disable CPU cache

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs. One long, two short beeps on checksum failure

POST Code	Description
99h	Check for SMART Drive (optional)
9Ah	Shadow option ROMs
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase F2 prompt
AAh	Scan for F2 key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST.
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS
B9h	Prepare Boot
BAh	Initialize SMBIOS
BBh	Initialize PnP Option ROMs
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error handler
C5h	PnPnd dual CMOS (optional)
C6h	Initialize note dock (optional)
C7h	Initialize note dock late
C8h	Force check (optional)
C9h	Extended checksum (optional)
CAh	Redirect Int 15h to enable remote keyboard
CBh	Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk
CCh	Redirect Int 10h to enable remote serial video

POST Code	Description
CDh	Re-map I/O and memory for PCMCIA
CEh	Initialize digitizer and display message
D2h	Unknown interrupt

The following are for boot block in Flash ROM

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

* If the BIOS detects errors on 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (*xxxx*) indicating the address line or bits that have failed. For example, "2C 0002" means address line 1 (bit one set) has failed. "2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.

Notes

Appendix C
Installing Software Drivers and the Windows Operating System

C-1 Introduction to the Adaptec Embedded Serial ATA RAID Controller Driver

Serial ATA (SATA)

Serial ATA(SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link which supports SATA Transfer rates from 150Mbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA(PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while Serial ATA cables can extend up to one meter. Overall, Serial ATA provides better functionality than Parallel ATA.

Introduction to the Intel 6300ESB I/O Controller Hub

Located in the South Bridge of the Intel E7520 Chipset, the 6300ESB I/O Controller Hub provides the I/O subsystem with access to the rest of the system. It supports 2-channel Ultra ATA/100 Bus Master IDE controller (PATA) and two Serial ATA (SATA) Host Controllers, which support up to two Serial ATA ports and up to two RAID drives. The 6300ESB I/O Controller Hub supports the following Parallel ATA (PATA) and Serial (SATA) device configurations:

ATA Operate Mode

You can select from the following two modes: Combined Mode and Enhanced Mode.

The Combined Mode:

In this mode, system BIOS assigns the traditional IRQ 14 and IRQ 15 for the use of HDD. Up to 4 ATA devices are supported by this mode.

Within the Combined Mode, the following three modes are supported:

*Non-Combined Mode: Parallel ATA only :with the maximum of 4 devices supported;

*Non-Combined Mode: Serial ATA only: with the maximum of 2 devices supported;

Primary Master(=PM)	Yes	Yes	No	No	No	No
Primary Slave(=PS)	Yes	No	Yes	No	No	No
Secondary Master(=SM)	Yes	No	No	Yes	No	No
Secondary Slave(=SS)	Yes	No	No	No	Yes	No
SATA Port0	No	SM	SM	PM	PM	PM
SATA Port1	No	SS	SS	PS	PS	PS
*Note: (No=Not Present, Yes=Present) Also, if Logical Primary is selected, the IDE channels are no longer available.						

The Enhanced Mode:

In this mode, system BIOS will automatically search for all available IRQs for the use of HDD. For newer Operating Systems that support the Enhanced Mode, such as Windows XP, Windows 2000, and Windows 2003, you can set SATA and PATA to the Enhanced Mode. (*The newer Operating Systems can accommodate both Enhanced Mode and Combined Mode and support up to 6 ATA devices.)

(*Please refer to the "Advanced Chipset Control" under the "Advanced" Setup in the BIOS for the selection of Combined Mode or Enhanced Mode,).

Configuring BIOS settings for the SATA RAID Functions (Enhanced Mode)

1. Press the <Del> key during system bootup to enter the BIOS Setup Utility.

(Note: If it is the first time to power on the system, we recommend that you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Menu. Once in the "Exit" Menu, scroll down the menu to select the item- "Load System Default" and press the <Enter> key. Select "OK" to confirm the selection. Press the <Enter> key to load the default settings to the BIOS.

3. Use the arrow keys to select the "Main" Menu in the BIOS.

4. Scroll down to "SATA RAID Enable" and press the <Enter> Key to select this option.

5. From this submenu, select "Enable" and press <Enter>.

6. Tap the <Esc> key and scroll down to "Exit". Select "Save and Exit" from the "Exit" menu. Press the <Enter> key to save the changes and exit the BIOS.

7. Once you've exited the BIOS Utility, the system will re-boot.

8. During the system startup, press the <Ctrl> and the <A> keys simultaneously to run the Adaptec RAID Configuration Utility when prompted by the following message:

Press <Ctrl><A> for Adaptec RAID Configuration Utility.

The Adaptec Embedded Serial ATA with HostRAID Controller Driver

Adaptec's Embedded Serial ATA RAID with HostRAID controller adds RAID functionality to the Serial ATA I/O controller by supporting RAID 0 (Striping) or RAID 1 (Mirroring) to enhance the industry's pioneer PCI-to-e host controller products. RAID striping (RAID 0) can greatly improve hard disk I/O performance because of its capability in striping data across multiple drives. RAID mirroring (RAID 1) allows the data to be simultaneously written to two drives, so critical data is always available even if a single hard disk fails. Due to the built-in functionality, the X6DH3-G2/X6DHi-G2 is specially designed to keep pace with the increasing performance demands of computer systems by improving disk I/O throughput and providing data accessibility regardless of a single disk failure. By incorporating the Adaptec Embedded Serial ATA into the motherboard design, Supermicro's X6DH3-G2/X6DHi-G2 offers the user with the benefits of SATARAID without the high costs associated with hardware RAID applications.

(Note: For Adaptec's RAID Driver Installation Instructions, please refer to the Adaptec RAID Controller User's Guide: "Emb_SA_RAID_UG.pdf" in the CD that came with this motherboard. You can also download a copy of Adaptec's User's Guide from our web site at www.supermicro.com.)

Using the Adaptec RAID Configuration Utility (ARC)

The Adaptec RAID Configuration Utility is an embedded BIOS Utility, including:

*Array Configuration Utility: Use this utility when you want to create, configure and manage arrays.

* Disk Utilities: Use this option to format or verify disks.

To run the Adaptec RAID Configuration Utility, you will need to enable the RAID function in the system BIOS (refer to Chapter 4 for System BIOS Configurations), and then, press the <Ctrl> and <A> keys simultaneously when prompted to do so during the system startup. (Refer to the previous page for detailed instructions.)

(Note: To select an option, use the arrow keys to highlight the item and then press the <Enter> key to select it. To return to the previous menu, press the <ESC> key.)

A. Using the Array Configuration Utility (ACU)

The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, add and delete spare drives, and initialize drives. During the system startup, press <Ctrl> and <A> key simultaneously, and the main menu will appear.
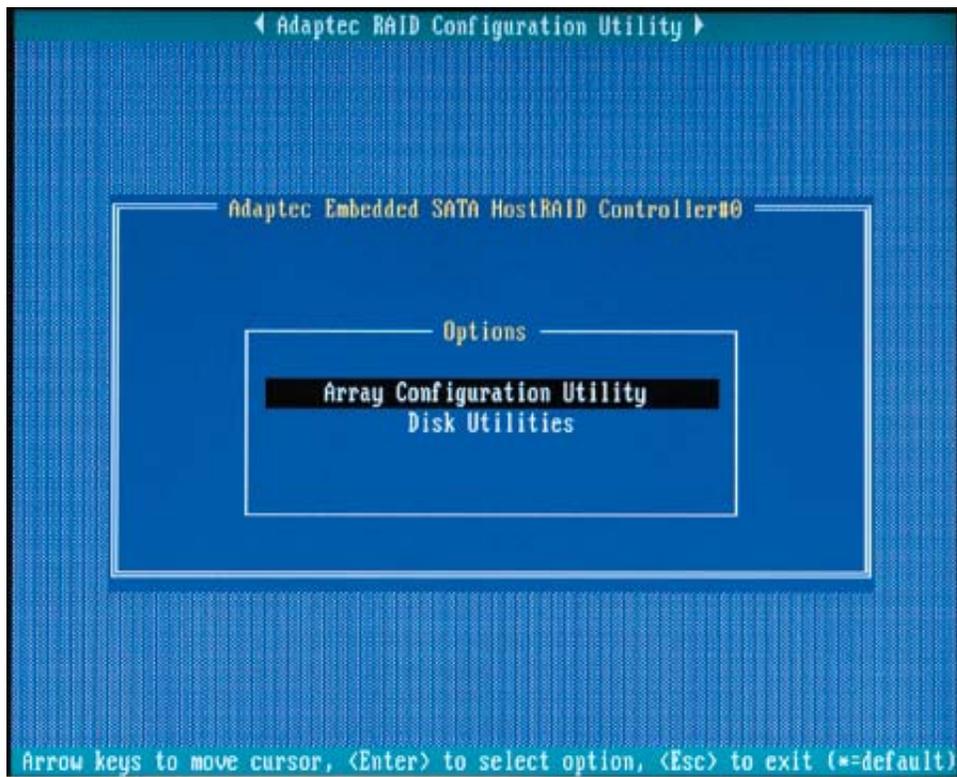
Managing Arrays

Select this option to view array properties, and delete arrays. The following sections describe the operations Of "Managing Arrays".

To select this option, use the arrow keys and the <enter> key to select "Managing Arrays" from the main menu (as shown above).

<u>Viewing Array Properties</u>

To view the properties of an existing array:

1. At the BIOS prompt, press Ctrl+A.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. From the ACU menu, select Manage Arrays (as shown on the previous screen.)

4. From the List of Arrays dialog box, select the array you want to view and press Enter.

The Array Properties dialog box appears, showing detailed information on the array. The physical disks associated with the array are displayed here.

5. Press Esc to return to the previous menu.

<u>Deleting Arrays</u>

*Warning: *Back up the data on an array before you delete it to prevent the loss of* data. Deleted arrays cannot be restored.

To delete an existing array:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC main menu, select Array Configuration Utility (ACU).
3. From the ACU menu, select Manage Arrays.

4. Select the array you wish to delete and press Delete.

5. In the Array Properties dialog box, select Delete and press
Enter. The following prompt is displayed:

<u>*Warning!! Deleting the array will render array unusable. Do you want to delete the array?(Yes/No):</u>

        RAID 1 only—the following prompt is also displayed:

<u>Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):</u>

6. Press Yes to delete the array or partition or No to return to the previous menu.
7. Press Esc to return to the previous menu.

Creating Arrays

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are un-initialized are shown in gray and cannot be used. See *Initializing Disk Drives*.

To create an array:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility Main Menu (ACU) (as shown on the first screen on page C-5).

3. From the ACU menu, select Create Array.

4. Select the disks for the new array and press Insert (as the screen shown below).

(**Note**: To deselect any disk, highlight the disk and press Delete.)
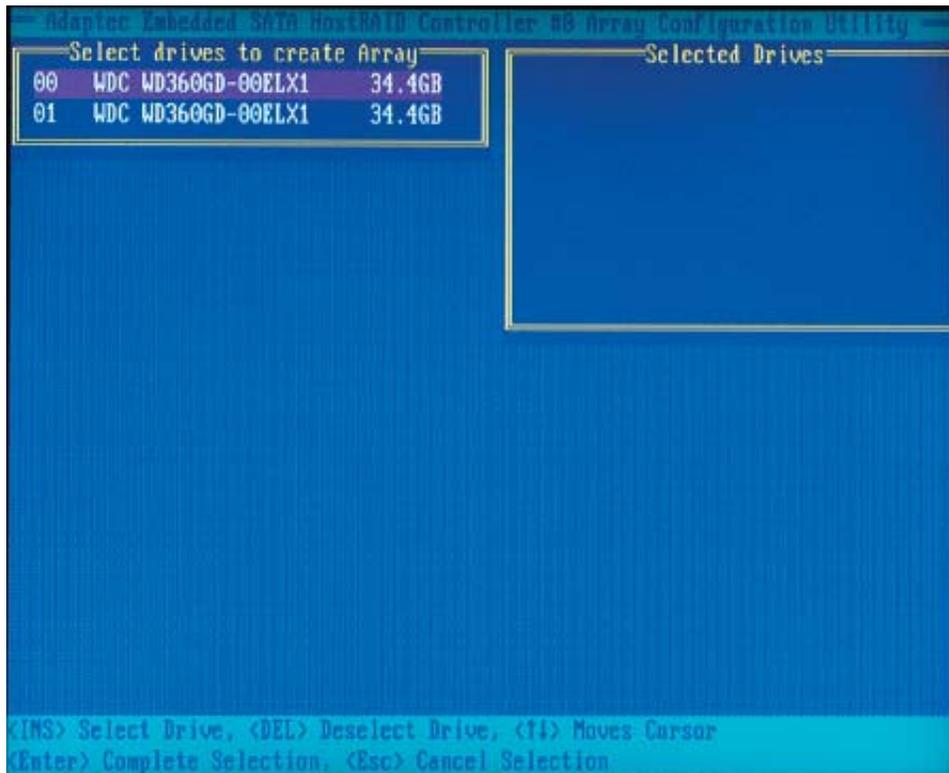
5. Press Enter when both disks for the new array are selected. The Array Properties menu displays (as the screen shown below).
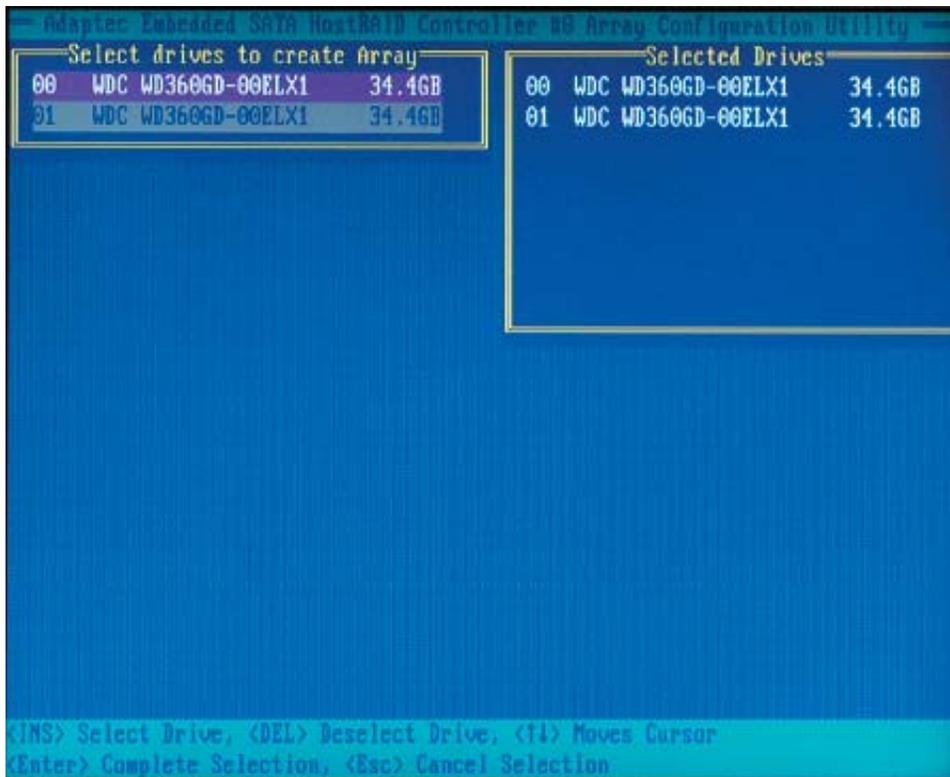
Assigning Array Properties

Once you've create a new array, you are ready to assign the properties to the array.

*Caution: Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. You will need to use the Adaptec Storage Manager - Browser Edition. (Refer to Adaptec's User's Guide in the enclosed CD.)

To assign properties to the new array:

1. In the Array Properties menu (as shown in the screen below), select an array type and press Enter.

Note: only the available array types: RAID 0, and RAID1, are displayed on the screen. (*RAID 0 or RAID 1 requires two drives.)

2. Under the item "Arrays Label", type in an label and press Enter. (Note: The label shall not be more than 15 characters.)

3. For RAID 0, select the desired stripe size. (Note: Available stripe sizes are 16, 32, and 64 KB-default. It is recommended that you do not change the default setting.)

4. The item: "Create RAID via" allows you to select between the different creating methods for RAID 0 and RAID 1.

The following table gives examples of when each is appropriate.

Raid Level	Create Via	When Appropriate
RAID 0	No Init	Creating a RAID 0 on new drives
RAID 0	Migrate (*Note)	Creating a RAID 0 from one new drive and one drive with data you wish to preserve
RAID 1	Build1	Any time you wish to create a RAID 1, but especially if you have data on one drive that you wish to preserve
RAID 1	Clear	Creating a RAID 1 on new drives, or when you want to ensure that the array contains no data after creation.
RAID 1	Quick	Fastest way to create a RAID 1. Appropriate when using new drives
RAID 1	Init	

(Note: If you select Migrate for RAID 0, or Build for RAID 1, you will be asked to select the source drive. The contents of the source drive will be preserved. However, the data on the new drive will be lost.)

5. When you are finished, press Done (as the screen shown below).

Notes:

1. Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

2. If you stop the Build or Clear process on a RAID 1 from ACU, you can restart it by pressing Ctrl+R.

3. A RAID 1 created using the Quick Init option may return some data mis-matches if you later run a consistency check. This is normal and is not a cause for concern.

4. The ACU allows you to use drives of different sizes in a

RAID . However, during a build operation, only the smaller drive can be selected as the source or first drive.

5. When migrating from single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

6. Adaptec does not recommend that you migrate or build an array on Windows dynamic disks (volumes), as it will result in data loss.

Warning: Do not interrupt the creation of a RAID 0 using the Migrate option. If you do, you will not be able to restart, or to recover the data that was on the source drive.

Adding a Bootable Array

To make an array bootable:

1. From the Main menu, select Manage Arrays.

2. From the List of Arrays, select the array you want to make bootable, and press Ctrl+B.

3. Enter Y to create a bootable array when the following message is displayed: "This will make all other existing bootable array non-bootable. Do you want to make this array bootable? (Yes/No):" Then, a bootable array will be created. An asterisk will appear next to the bootable array (as shown in the picture below:)
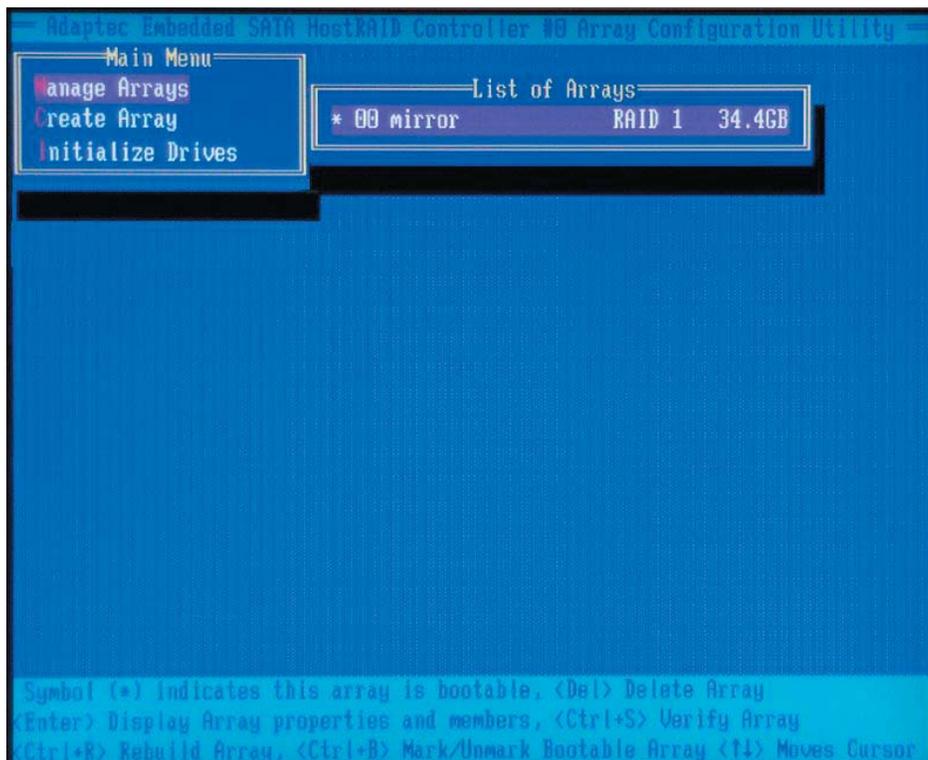
Deleting a Bootable Array

To delete a bootable array:

1. From the Main menu, select Manage Arrays.

2. From the List of Arrays, select the bootable array (*) you want to delete, and press Ctrl+B. (* a bootable array is the array marked with an asterisk (as shown in the picture above.)

3. Enter Y to delete a bootable array when the following message is displayed: "The array is already marked bootable. Do you want to make this array as not bootable? (Yes/No):" Then, the bootable array will be deleted and the asterisk will disappear. **(Note: do not use the delete key to delete the bootable array.)**

Initializing Disk Drives

If an installed disk does not appear in the disk selection list for creating a new array, or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.

Caution: Initializing a disk overwrites the partition table on the disk and makes any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again.

Do not initialize a disk that is part of a boot array.

To determine which disks are associated with a particular array, please refer to Viewing Array Properties.

To initialize drives:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility (ACU) (as shown in the screen below).
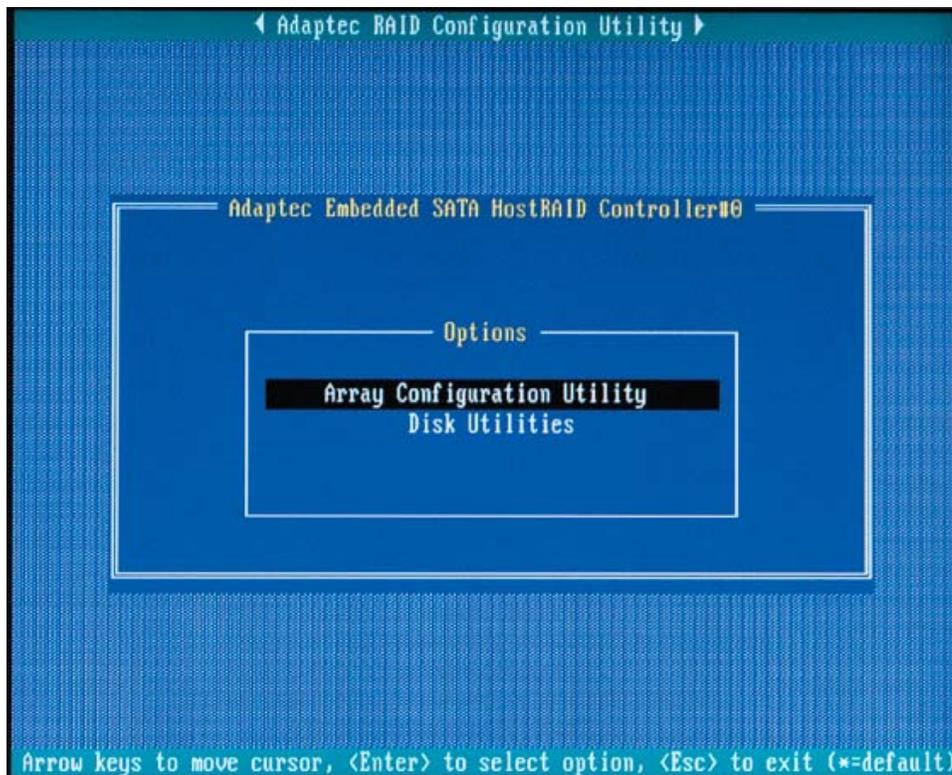
3. Select Initialize Drives (as shown in the screen below).
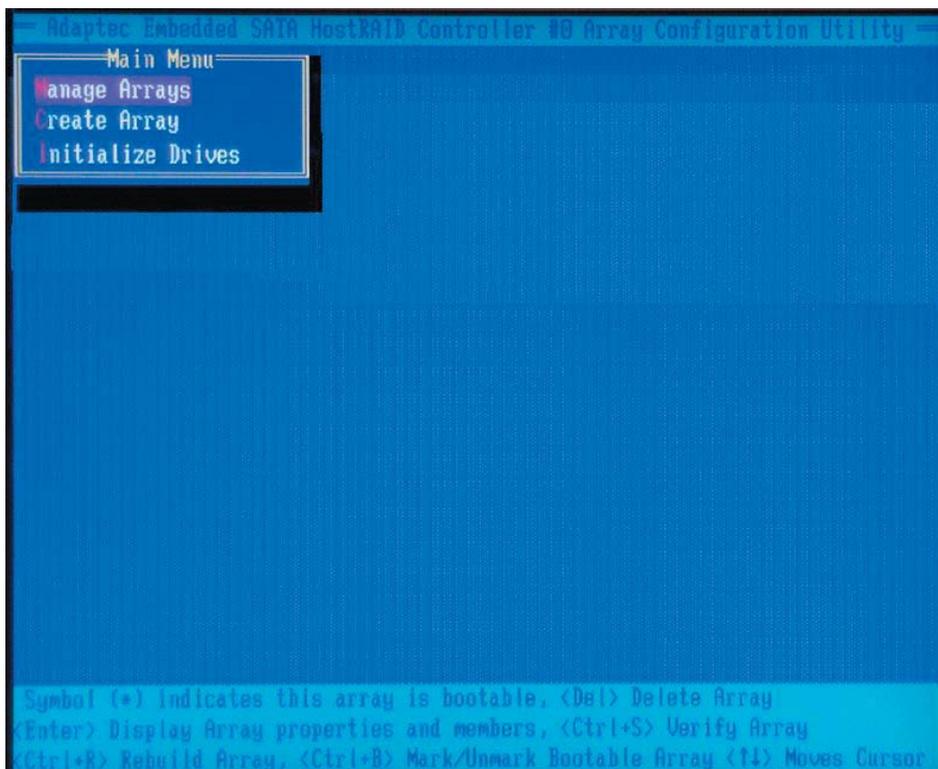
4. Use the up and down arrow keys to select the disk you wish to initialize and press Insert (as shown in the screen below).
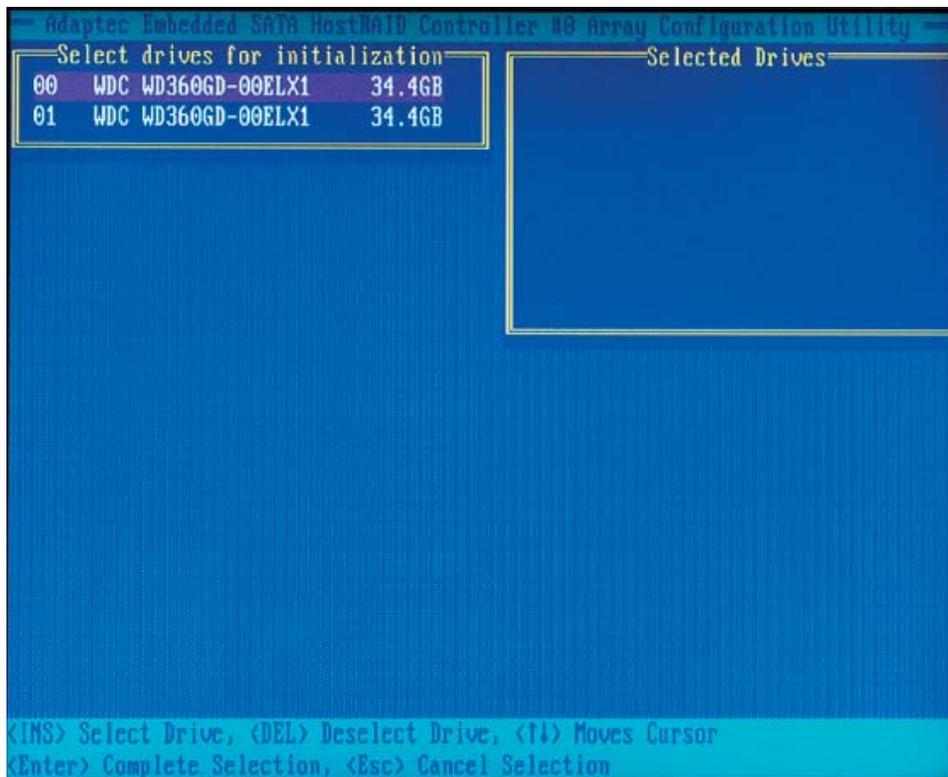
5. Repeat Step 4 so that both drives to be initialized are selected (as shown in the screen below).
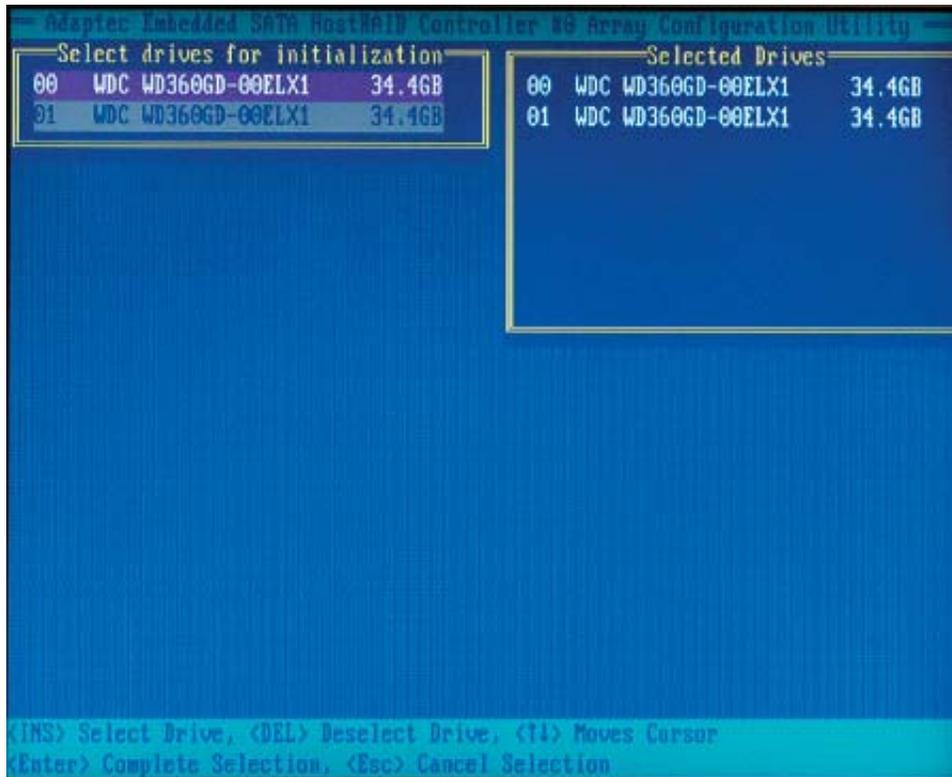
6. Press Enter.

7. Read the warning message as shown in the screen.
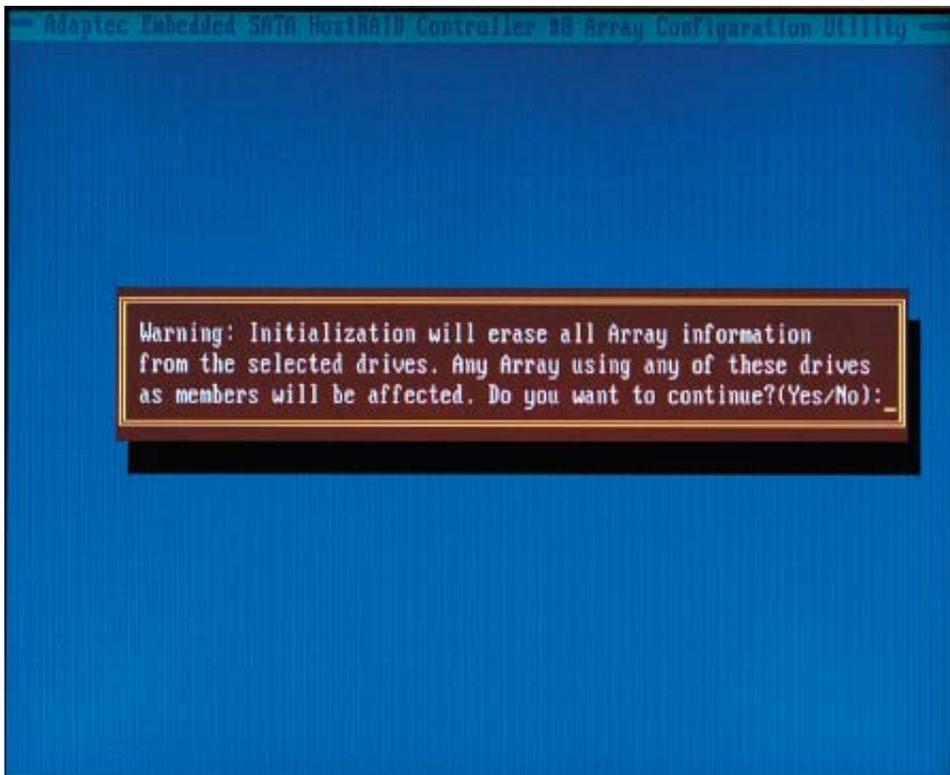
8. Make sure that you have selected the correct disk drives to initialize. If correct, type Y to continue.

Rebuilding Arrays

Note 1: Rebuilding applies to Fault Tolerant array (RAID 1) only.

If an array Build process (or initialization) is interrupted or critical with one member missing, you must perform a Rebuild to get the array to Optimal status. For a critical array Rebuild operation, the optimal drive is the source drive.

Note 2: If no spare array exists and a hard disk drive fails, you need to create a spare before you can rebuild an array.

<u>To Rebuild an array:</u>

1. From the Main Menu, select Manage Arrays (as shown in the screen below). From the List of Arrays, select the array you want to Rebuild.

2. Press Ctrl+R to Rebuild.
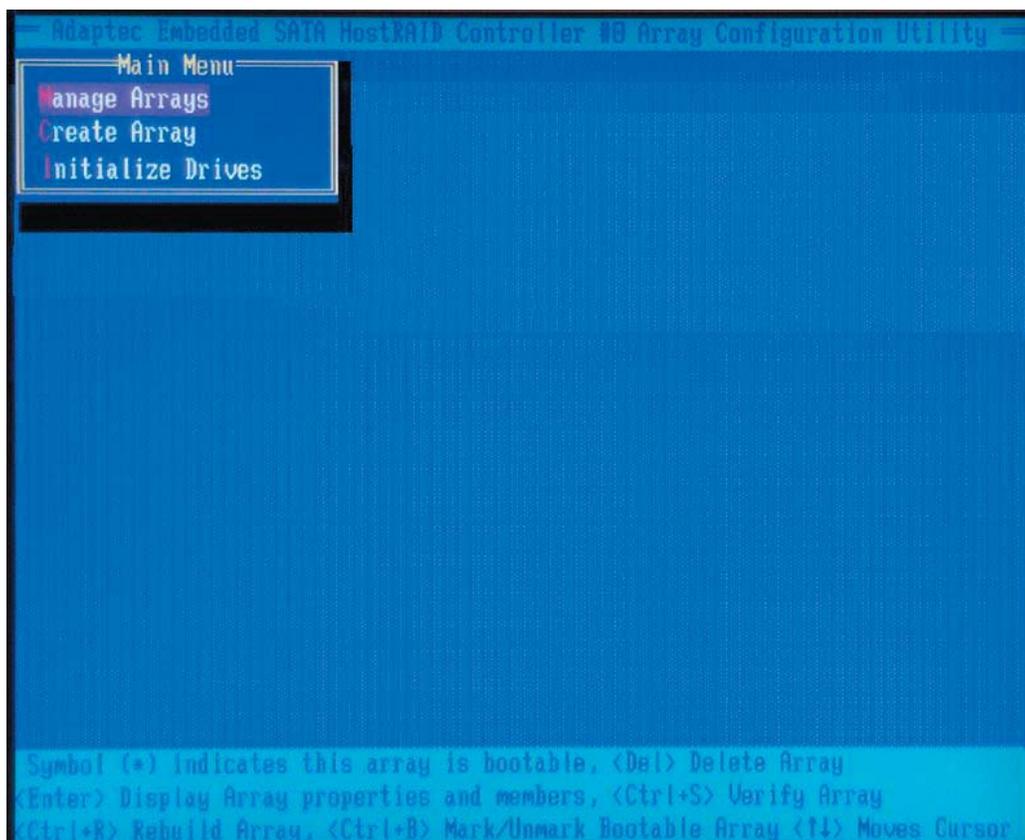
The Adaptec Embedded SAS/SATA with HostRAID Controller Driver (*SAS is for the X6DH3-G2 only.)

The onboard Adaptec AIC9140W SAS Controller supports two ports. Each port supports up to four SAS/SATA drives.

* The SAS Cable (CBL-097) can only be used with backplanes that support both SAS and SATA.

* If Supermicro's chassis is used, the backplane must be Rev.2.0 or above, which came with gold trims.

* If you want to use this motherboard with Supermicro's SAS Mobile Racks, such as CSE-M28E1, make sure to use Cable CBL-0116. (Note: Cable CBL-0116 is a corss-over cable, and is not provided with this motherboard.)

Using the Adaptec RAID Configuration Utility (ARC)

The onboard SAS Controller is enabled by default. To disable it, please set Jumper JPS1 to Pins 2-3 (See Page 2-5 for details and jumper location.)

* Upon detecting the SAS Controller BIOS, please make sure that the Adapter WWN address is listed. This is a 16-digit number. If this number is not shown, you will not be able to use the controller.

* Once the WWN address is listed, press the <Ctrl> and <A> keys simultaneously when prompted to access the Adaptec SAS RAID BIOS. (Note: To select an option, use the arrow keys to highlight the item and then press the <Enter> key to select it. To return to the previous menu, press the <ESC> key.)

The Adaptec RAID Configuration Utility is an embedded BIOS Utility, including:

*Array Configuration Utility: Use this utility when you want to create, configure and manage arrays.

* SerialSelect Utility: Use this option to configure SAS/SATA RAID drives.

* Disk Utilities: Use this option to format or verify disks.

A. Using the Array Configuration Utility (ACU)

The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, add and delete spare drives, and initialize drives. During the system startup, press <Ctrl> and <A> key simultaneously, and the main menu will appear.
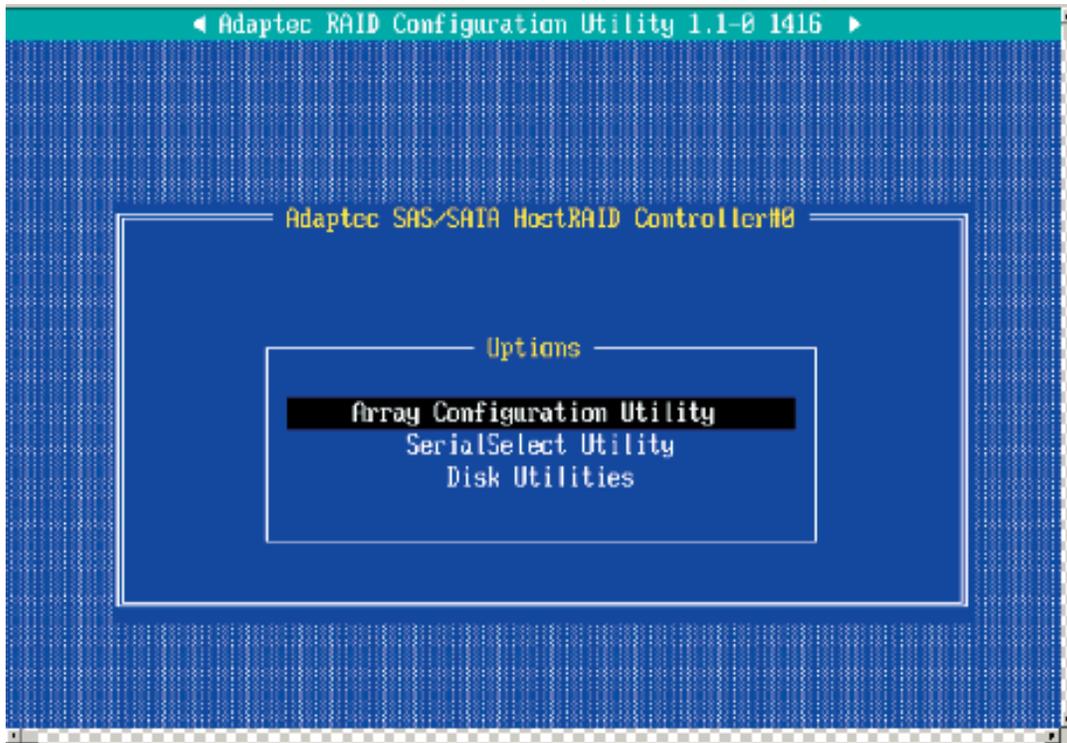
Managing Arrays

Select this option to view array properties, and delete arrays. The following sections describe the operations Of "Managing Arrays".

To select this option, use the arrow keys and the <enter> key to select "Managing Arrays" from the main menu.

Viewing Array Properties

To view the properties of an existing array:

1. At the BIOS prompt, press Ctrl+A.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. From the ACU menu, select Manage Arrays (as shown on the previous screen.)

4. From the List of Arrays dialog box, select the array you want to view and press Enter.

The Array Properties dialog box appears, showing detailed information on the array. The physical disks associated with the array are displayed here.

5. Press Esc to return to the previous menu.

Deleting Arrays

*Warning: Back up the data on an array before you delete it to prevent the loss of data. Deleted arrays cannot be restored.

To delete an existing array:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC main menu, select Array Configuration Utility (ACU).

3. From the ACU menu, select Manage Arrays.

4. Select the array you wish to delete and press Delete.

5. In the Array Properties dialog box, select Delete and press Enter. The following prompt is displayed:

*Warning!! Deleting the array will render array unusable. Do you want to delete the array?(Yes/No):

    RAID 1 only—the following prompt is also displayed:

Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):

6. Press Yes to delete the array or partition or No to return to the previous menu.
7. Press Esc to return to the previous menu.

Creating Arrays

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are un-initialized are shown in gray and cannot be used. See Initializing Disk Drives.

To create an array:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility Main Menu (ACU) (as shown on the first screen on the previous page).

3. From the ACU menu, select Create Array.

4. Select the disks for the new array and press Insert.

(Note: To deselect any disk, highlight the disk and press Delete.)

5. Press Enter when both disks for the new array are selected. The Array Properties menu displays.

Assigning Array Properties

Once you've create a new array, you are ready to assign the properties to the array.

*Caution: Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. You will need to use the Adaptec Storage Manager - Browser Edition. (Refer to Adaptec's User's Guide in the enclosed CD.)

To assign properties to the new array:

1. In the Array Properties menu, select an array type and press Enter.

Note that only the available array types: RAID 0, and RAID1, are displayed on the screen. (*RAID 0 or RAID 1 requires two drives.)

2. Under the item "Arrays Label", type in an label and press Enter. (Note: The label shall not be more than 15 characters.)

3. For RAID 0, select the desired stripe size. (Note: Available stripe sizes are 16, 32, and 64 KB-default. It is recommended that you do not change the default setting.)

4. The item: "Create RAID via" allows you to select between the different creating methods for RAID 0 and RAID 1.

The following table gives examples of when each is appropriate.

Raid Level	Create Via	When Appropriate
RAID 0	No Init	Creating a RAID 0 on new drives
RAID 0	Migrate (*Note)	Creating a RAID 0 from one new drive and one drive with data you wish to preserve
RAID 1	Build1	Any time you wish to create a RAID 1, but especially if you have data on one drive that you wish to preserve
RAID 1	Clear	Creating a RAID 1 on new drives, or when you want to ensure that the array contains no data after creation.
RAID 1	Quick	Fastest way to create a RAID 1. Appropriate when using new drives
RAID 1	Init	

(**Note**: If you select Migrate for RAID 0, or Build for RAID 1, you will be asked to select the source drive. The contents of the source drive will be preserved. However, the data on the new drive will be lost.)

5. When you are finished, press Done.

Notes:

1. Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

2. If you stop the Build or Clear process on a RAID 1 from ACU, you can restart it by pressing Ctrl+R.

3. A RAID 1 created using the Quick Init option may return some data mis-matches if you later run a consistency check. This is normal and is not a cause for concern.

4. The ACU allows you to use drives of different sizes in a RAID . However, during a build operation, only the smaller drive can be selected as the source or first drive.

5. When migrating from single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

6. Adaptec does not recommend that you migrate or build an array on Windows dynamic disks (volumes), as it will result in data loss.

Warning: Do not interrupt the creation of a RAID 0 using the Migrate option. If you do, you will not be able to restart, or to recover the data that was on the source drive.

Adding a Bootable Array

To make an array bootable:

1. From the Main menu, select Manage Arrays.

2. From the List of Arrays, select the array you want to make bootable, and press Ctrl+B.

3. Enter Y to create a bootable array when the following message is displayed: "This will make all other existing bootable array non-bootable. Do you want to make this array bootable? (Yes/No):" Then, a bootable array will be created. An asterisk will appear next to the bootable array.

Deleting a Bootable Array

To delete a bootable array:

1. From the Main menu, select Manage Arrays.

2. From the List of Arrays, select the bootable array (*) you want to delete, and press Ctrl+B. (* a bootable array is the array marked with an asterisk.)

3. Enter Y to delete a bootable array when the following message is displayed: "The array is already marked bootable. Do you want to make this array as not bootable? (Yes/No):" Then, the bootable array will be deleted and the asterisk will disappear.

(**Note**: do not use the delete key to delete the bootable array.)

Initializing Disk Drives

If an installed disk does not appear in the disk selection list for creating a new array, or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.

Caution: Initializing a disk overwrites the partition table on the disk and makes any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again.

Do not initialize a disk that is part of a boot array. To determine which disks are associated with a particular array, please refer to Viewing Array Properties.

To initialize drives:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. Select Initialize Drives.

4. Use the up and down arrow keys to highlight the disk you wish to initialize and press Insert.

5. Repeat Step 4 so that both drives to be initialized are selected.

6. Press Enter.

7. Read the warning message displayed in the screen.

8. Make sure that you have selected the correct disk drives to initialize. If correct, type Y to continue.

Rebuilding Arrays

*Note 1: Rebuilding applies to Fault Tolerant array (RAID 1) only.

If an array Build process (or initialization) is interrupted or critical with one member missing, you must perform a Rebuild to get the array to Optimal status. For a critical array Rebuild operation, the optimal drive is the source drive.

*Note 2: If no spare array exists and a hard disk drive fails, you need to create a spare before you can rebuild an array.

To Rebuild an array:

1. From the Main Menu, select Manage Arrays. From the List of Arrays, select the array you want to Rebuild.

2. Press Ctrl+R to Rebuild.

Using the SerialSelect Utility to Configure SAS Settings (*SAS is for the X6DH3-G2 only.)

The SerialSelect Utility enables you to configure SAS disk drive settings.

To access the SAS utilities:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility. (as shown in the screen below.)
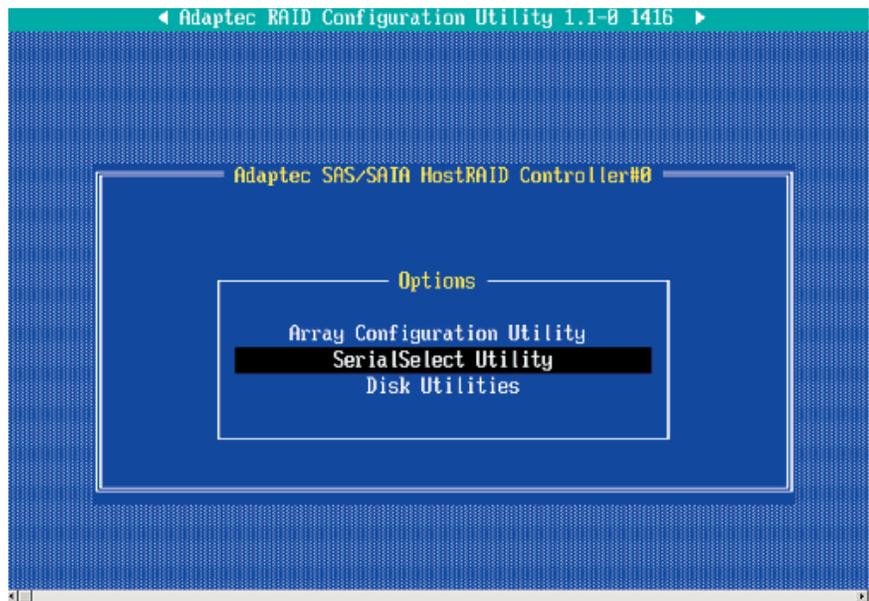

2. Use the arrow keys to select "SerialSelect Utility" and press <Enter> to access the Controller Configuration submenu:
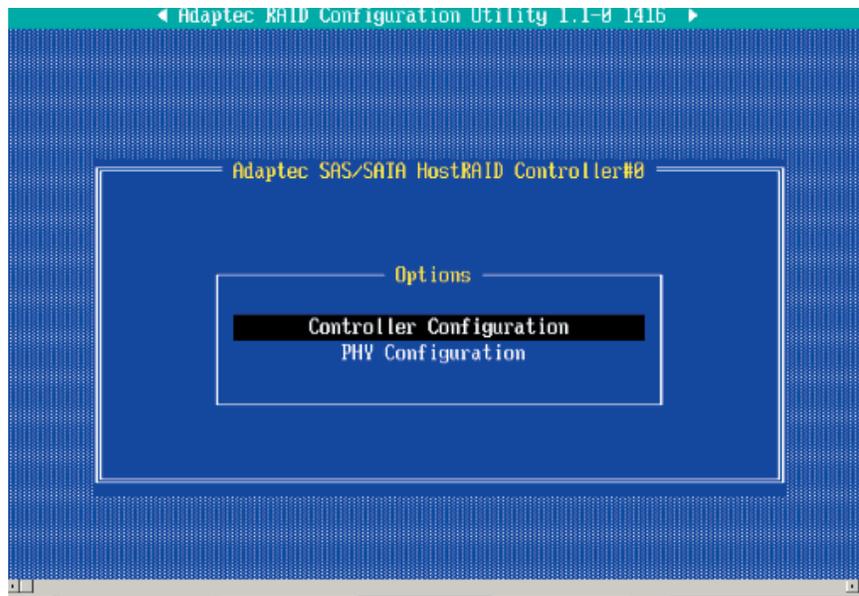
To Set Controller Configuration:

3. Select "Controller Configuration" and press <Enter> to access the submenu as shown below:
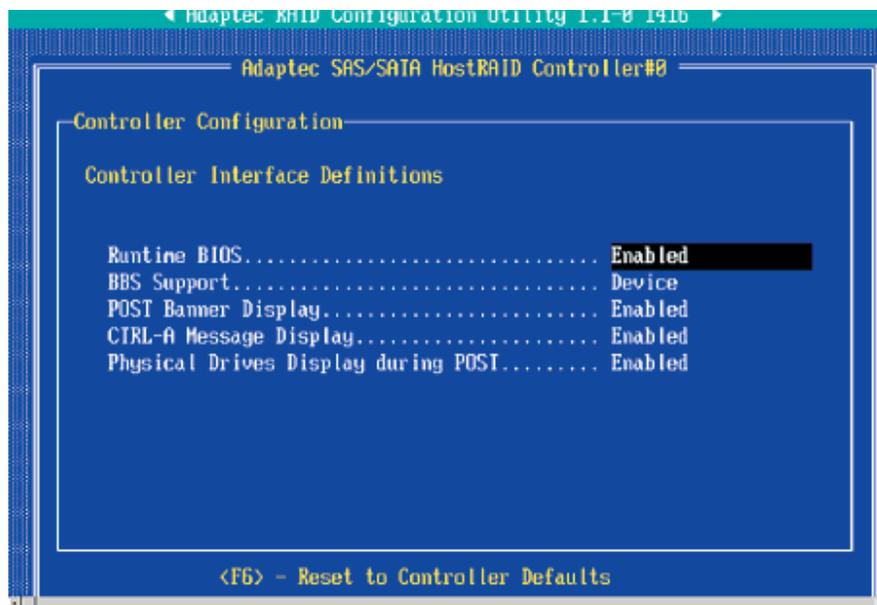
4. Use the arrow keys to select an item. Then, press <Enter> and the arrow keys to configure the setting for the item selected.

5. To load the default settings, press <F6>.

(**Note**: The default setting for each item is listed below:

Runtime BIOS: Enabled,

BBS Support: Device,

POST Banner Display: Enabled,

CTRL-A Message Display: Enabled,

Physical Drives Display during POST: Enabled,)

6. Press <Esc> to return to the previous menu and to exit the utility.

To Set Physical Configuration:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. Use the arrow keys to select "SerialSelect Utility" and press <Enter> to access the Physical Configuration submenu as shown below:
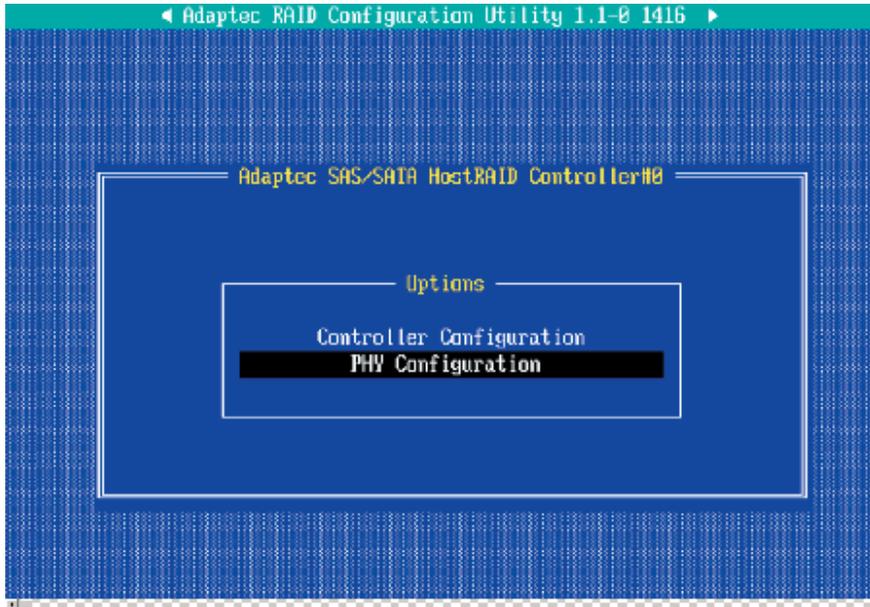
3. Select "Physical Configuration" and press <Enter> to access SAS Device Configuration submenu as shown below:
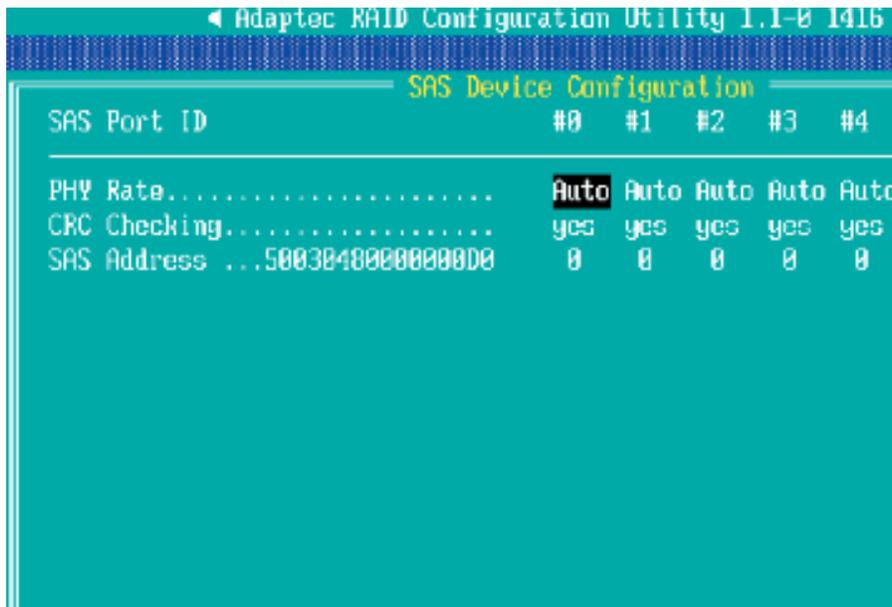

4. Use the arrow keys to select an item. Then, press <Enter> and the arrow keys to configure the item selected.

5. To load default settings, press <F6>.

6. Press <Esc> to return to the previous menu and to exit the utility.

Using the Disk Utilities

The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

To access the disk utilities:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility (as shown in the screen below.)
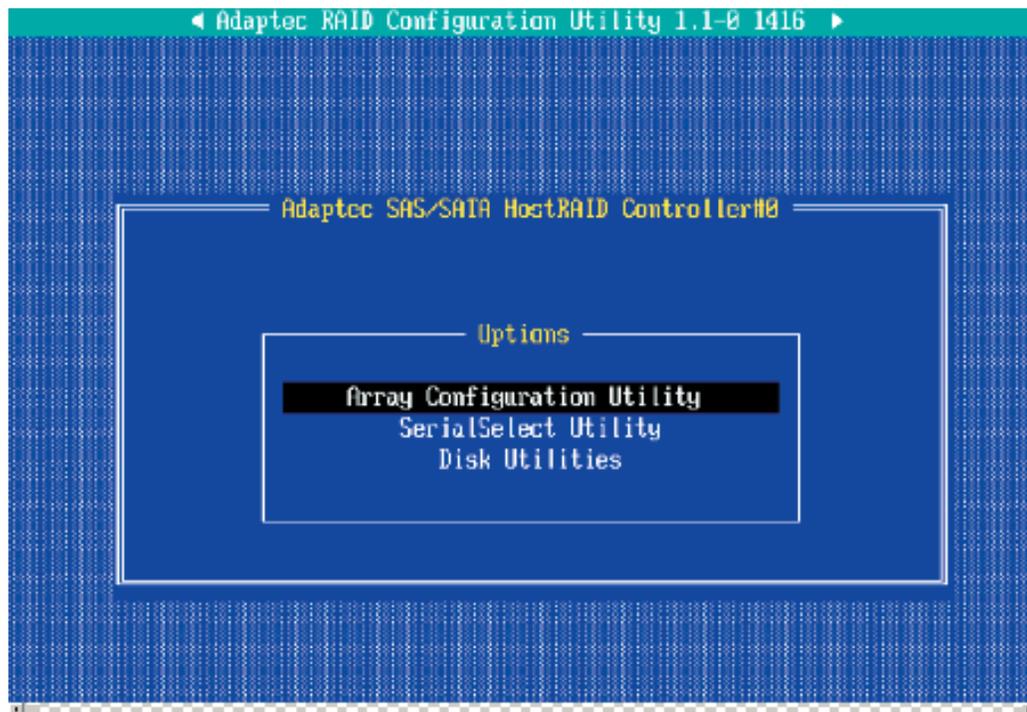
2. From the ARC menu, select Disk Utilities from the screen as shown above and press Enter.

3. When the submenu appears, select the desired disk and press Enter

The following options are available:

1. Format Disk—Simulates a low-level format of the hard drive by writing zeros to the entire disk. (Note: Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.)

(*Caution: Formatting disk erases all data on the drive. Be sure to back up your data before performing this operation.)

2. Verify Disk Media—Scans the media of a disk drive for defects.

To Exit Adaptec RAID Configuration Utility

1. Once you have completed RAID array configurations, press ESC to exit. The following screen will appear.

2. Press Yes to exit the Utility.
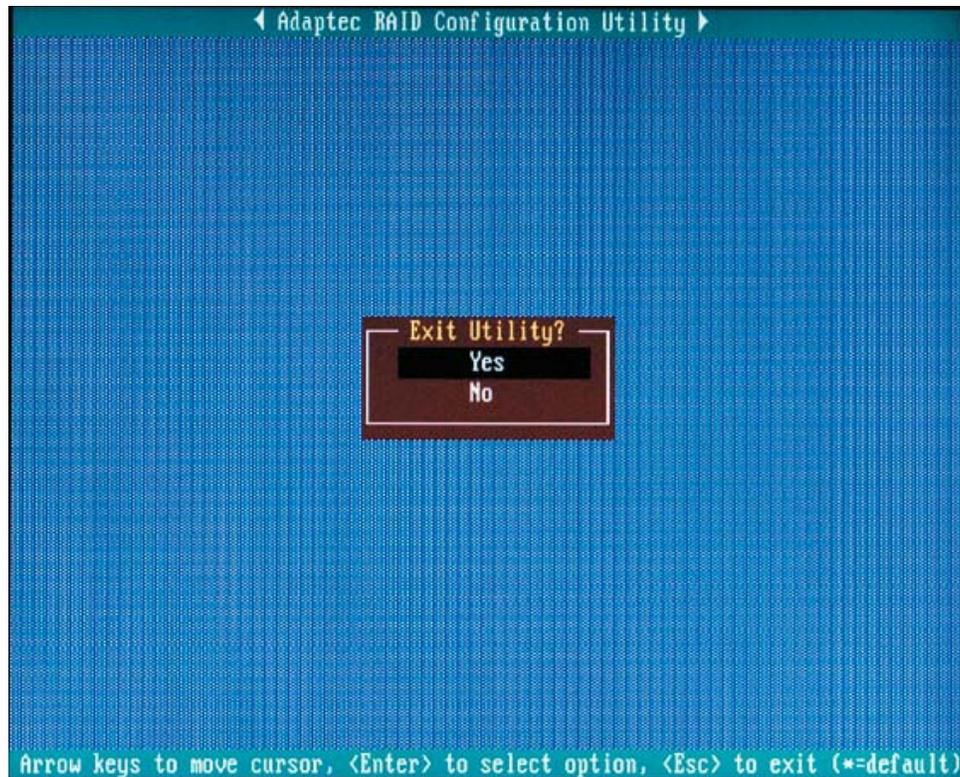
(*For more information regarding Adaptec RAID Utility, please refer to Adaptec's User's Guide in the CD included in your shipping package. You can also download a copy of Adaptec User's Guide from our web site at: www. supermicro.com.)

## C-2 Installing the 6300ESB/SAS Driver and the Windows Operating System

(*SAS is for the X6DH3-G2 only.)

a. Insert Supermicro's bootable CD that came with the package into the CD Drive during the system reboot, and the screen: "Super Micro Driver Diskette Maker" will appear.

b. From the list displayed on the screen, choose the item: "Intel 6300 ESB/ICH5R Driver by 3rd Party (Adaptec)" or "SAS" and press <ENTER>.

c. From the next screen displayed, choose the OS driver you want to install and press <Enter>.

d. Insert a formatted diskette into drive A: and press <Enter> as prompted.

e. Exit the program after the process is completed. Then, reboot the system.

f. Insert the Microsoft Windows OS Setup CD in the CD Driver, and the system will start to boot up from CD.

g. Press the <F6> key when the message-"Press F6 if you need to install a third party SCSI or RAID driver" displays.

h. When the Windows OS Setup screen appears, press "S" to specify additional device(s).

i. Insert the driver diskette-"Adaptec Embedded Serial ATA Raid Controller Driver" into Drive A: and press the <Enter> key.

j. Choose the Adaptec Embedded Host Serial ATA Raid Controller from the list indicated in the Windows OS Setup Screen, and press the <Enter> key.

k. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

l. From the Windows OS Setup screen, press the <Enter> key. The OS Setup will automatically load all device files, and, then, continue the Windows OS installation.

m. After the Windows OS Installation is completed, the system will automatically reboot.

C-3 Installing Other Software Programs and Drivers

A. Installing Drivers other than Adaptec Embedded Serial ATA RAID Controller Driver

After you've installed the Windows Operating System, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these software programs and drivers, click the icons to the right of these items.
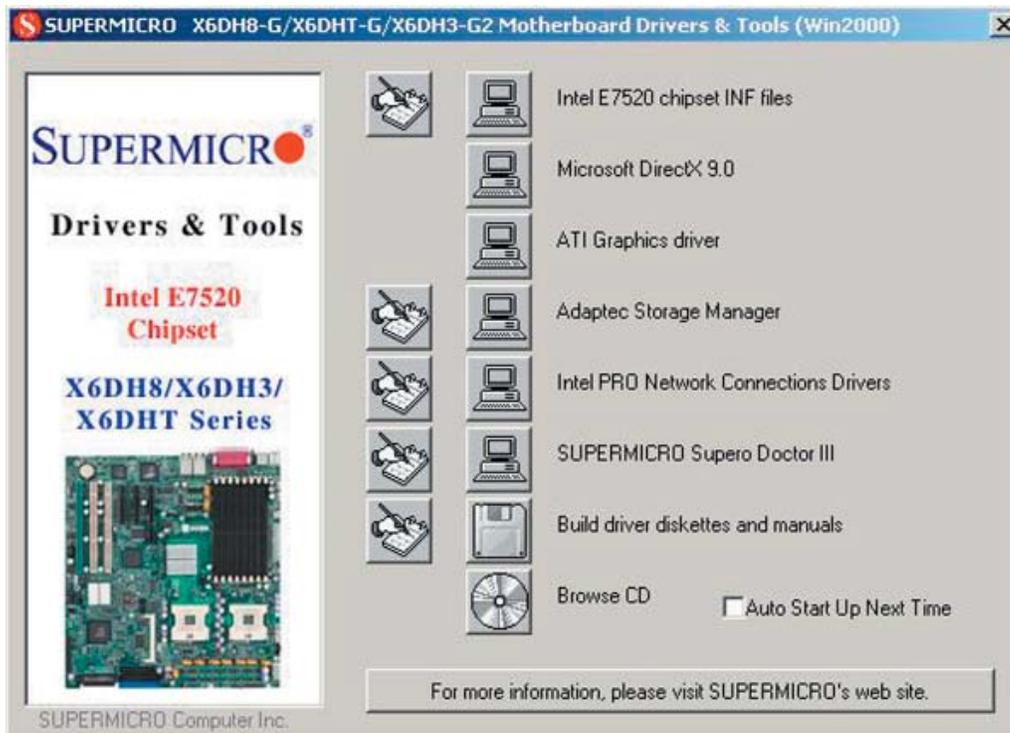
Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on the paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.)

(*Please refer to the Adaptec User's Guide for the installation of the Adaptec Serial ATA RAID Controller Driver. Adaptec's User Guide is included in the CD. You can also download a copy of the user's guide from our web site.)

Supero Doctor III

The Supero Doctor III program is a Web-base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called the SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Note 1: The Default User Name and Password are ADMIN.

Note 2: In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

Supero Doctor III Interface Display Screen-I (Health Information)

Supero Doctor III Interface Display Screen-II (Remote Control)

Notes: 1. SD III Software Revision 1.0 can be downloaded from our Web site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/User-Guide.pdf. For Linux, we will still recommend Supero Doctor II. 2. For detailed information on Adaptec's SCSI SATA RAID Utility, please refer to the CDs that came with your motherboard.